(1)

AD-A283 416

NAVAL POSTGRADUATE SCHOOL

Monterey, California

DTIC ELECTE AUG 1 6 1994 S G D

THESIS

LASER-DOPPLER VELOCIMETER MEASUREMENTS IN A CASCADE OF CONTROLLED DIFFUSION COMPRESSOR BLADES AT STALL

by

Humberto Javier Ganaim Rickel

June, 1994

Principal Advisor: Garth V. Hobson

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188

1. AGENCY USE ONLY (Leave Blank)	2. REPORT DATE	3. REPORT TYPE
	June, 1994	Master's Thesis

4. TITLE AND SUBTITLE LASER-DOPPLER VELOCIMETER MEASUREMENTS IN A CASCADE OF CONTROLLED DIFFUSION COMPRESSOR BLADES AT STALL	5. FUNDING NUMBERS
6. AUTHOR(S) Ganaim Rickel, Humberto Javier	
7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000	8. PERFORMING ORGANIZATION
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
Approved for public release; distribution is unlimited.	A

13. ABSTRACT (Maximum 200 words)

An incipient compressor blade stall has been generated and examined in the Low Speed Cascade Wind Tunnel at the Turbopropulsion Laboratory. The test blades were a controlled-diffusion design with solidity 1.67, and stalling occured at 10 degrees of incidence above the design inlet air angle. Tufting and laser-sheet flow-visualization techniques showed that the stalling process was unsteady, and occurred over the whole cascade of 20 blades. Detailed laser-doppler velocimeter measurements over the suction side of the blades showed regions of continuous and intermittent reversed flow. The measurements of the continuous reversed flow region at the leading edge were the first data to be obtained of flow within the leading edge separation bubble. The intermittent reversed flow region measurements quantified what was observed in the flow visualization studies. Blade surface pressure measurements showed a decrease in normal force on the blade as would be expected at stall.

14. SUBJECT TERMS	16. PRICE CODE
	15. NUMBER OF PAGES 140

17. SECURITYCLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89)

Approved for public release; distribution is unlimited.

LASER-DOPPLER VELOCIMETER MEASUREMENTS IN A CASCADE OF CONTROLLED DIFFUSION COMPRESSOR BLADES AT STALL

by

Humberto Javier Ganaim Rickel
BS, Venezuelan Naval School, 1985

Submitted in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE IN ENGINEERING SCIENCE

from the

NAVAL POSTGRADUATE SCHOOL
June, 1994

Author: ______________________
Humberto Javier Ganaim Rickel

Approved By: ______________________
Dr. Garth V. Hobson, Advisor

____
Dr. Raymond P. Shreeve, Second Reader

____
Dr. Daniel J. Collins, Chairman
Department of Aeronautical and Astronautical Engineering

ABSTRACT

An incipient compressor blade stall has been generated and examined in the Low Speed Cascade Wind Tunnel at the Turbopropulsion Laboratory. The test blades were a controlled-diffusion design with solidity 1.67, and stalling occured at 10 degrees of incidence above the design inlet air angle. Tufting and laser-sheet flow-visualization techniques showed that the stalling process was unsteady, and occurred over the whole cascade of 20 blades. Detailed laser-doppler velocimeter measurements over the suction side of the blades showed regions of continuous and intermittent reversed flow. The measurements of the continuous reversed flow region at the leading edge were the first data to be obtained of flow within the leading edge separation bubble. The intermittent reversed flow region measurements quantified what was observed in the flow visualization studies. Blade surface pressure measurements showed a decrease in normal force on the blade as would be expected at stall.

TABLE OF CONTENTS

LIST OF FIGURES

ACKNOWLEDGEMENTS

I would like to avail myself of this opportunity to thank Dr. Garth V. Hobson for taking so much of his time to explain the procedures involved in this project to me and for all his patience during his explanation. I would also like to thank Dr. Raymond Shreeve for his advice, which positively influenced my thesis. I would like to thank my wife Jaira and my children, Humbert and Kevin, for giving me the support to finish my studies at the Naval Postgraduate School. Jaira: you are the main reason in my life that helps me improve.

I. INTRODUCTION

A. BACKGROUND

The continuing effort to predict off-design performance and stalling behavior of compressor blades during the design phase has prompted studies to characterize the flow in and around leading edge separation bubbles of blades in cascade. Experimental studies have attempted to map viscous flow development in specific geometries. Recently Hobson and Shreeve [Ref. 1] reported detailed two-component (LDV) measurements of the flow through a controlled-diffusion (CD) compressor cascade at a Reynolds number of about 700,000, and at a very high-incidence angle (8 deg above design).

They obtained a laminar leading-edge separation, which reattached turbulent, and enclosed a (laminar) bubble on the suction surface of the blade. Consistent with measurements at lower incidence angles, the reattached suction surface boundary layer remained turbulent and attached over the rear part of the blade. Since boundary layer separation (for a code-validation test case) had not been achieved, the next step was to increase the incidence angle further to 10 deg above design and try to stall the (CD) blades. This was the motivation for the present study in which the flowfield through the CD cascade was extensively surveyed at a fixed incidence angle which was 2 deg greater than the previous incidence reported by Hobson and Shreeve [Ref. 1].

B. PURPOSE

The objective was to increase the inlet air angle beyond 48 degrees, as tested by Classick [Ref. 2], Murray [Ref. 3], Hobson and Shreeve [Ref. 1], and Wakefield [Ref. 4], to 50 degrees in an attempt to stall the blades. The intention was to determine the maximum turning or lift generated by the blades, and to determine the way in which the suction-side boundary layer separated. Would the leading-edge separation bubble grow or

would separation begin from the trailing edge where the boundary layer was fully turbulent. Two-dimensional laser doppler velocimeter measurements were to be taken in the pitchwise or blade-to-blade direction at most of the stations measured by Hobson and Shreeve [Ref. 1].

Prior to performing the above study, LDV measurements at 48 degrees were obtained in the inlet region in order to verify the results that both Hobson and Shreeve [Ref. 1] and Wakefield [Ref. 4] obtained during their experiments. This was desirable because Hobson and Shreeve had used different inlet guide vanes (IGV's) and, after new IGV's were installed, Wakefield performed only Hot-Wire measurements. A comparison of the measurements taken by the present author with those taken by Hobson and Shreeve at 48 degrees is presented in Appendix A. The study carried out at an inlet-air angle of 50 degrees is reported in the sections which follow.

II. TEST FACILITY AND INSTRUMENTATION

A. LOW-SPEED CASCADE WIND TUNNEL

The subsonic cascade wind tunnel and operating instrumentation were as described by Wakefield [Ref. 5]. The cascade had 20 blades, the flow Reynolds number, based on chord length, was approximately 700,000 and the inlet air angle was 48 and 50 deg.

The blades had a chord length of 5.01 in. and a spacing of 3 in. The blade coordinates and cascade geometry were reported by Elazar [Ref. 5]. Figure 1 shows the schematic of the cascade.

B. INSTRUMENTATION

1. Pneumatic Data Acquisition System

Blade surface static pressure measurements were recorded with a 48-channel Scanivalve. The pneumatic data acquisition system was the same as that described and used by Classick [Ref. 2] and the program "ACQUIRE" was used to perform the pressure measurements. Figure 2 shows the location of the pressure taps on blade number 10, the location of which is shown in Figure 1.

2. Laser-Doppler Velocimeter

The horizontal (U) and vertical (V) mean velocity components, U-turbulence, V-turbulence, and Reynolds stress were measured with a two-dimensional LDV system consisting of four major subsystems:(a) the laser and optics, (b) the data acquisition system, (c) the automated traverse table, and (d) the seeding probe. A photograph of the LDV equipment, traverse table, counters and oscilloscope is shown in Figure 3, which also shows the north endwall of the cascade.

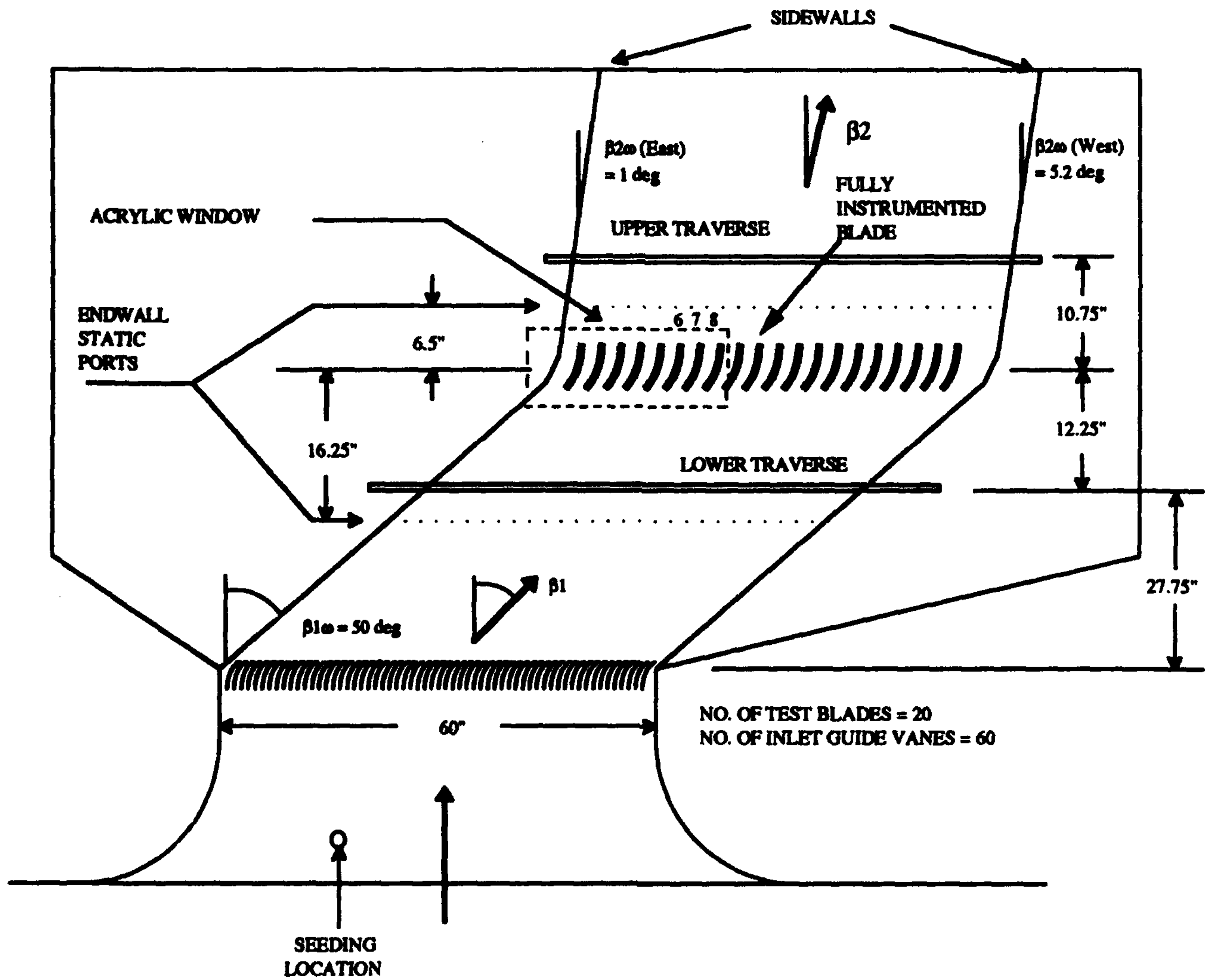


Figure. 1 Low Speed Cascade Tunnel Schematic

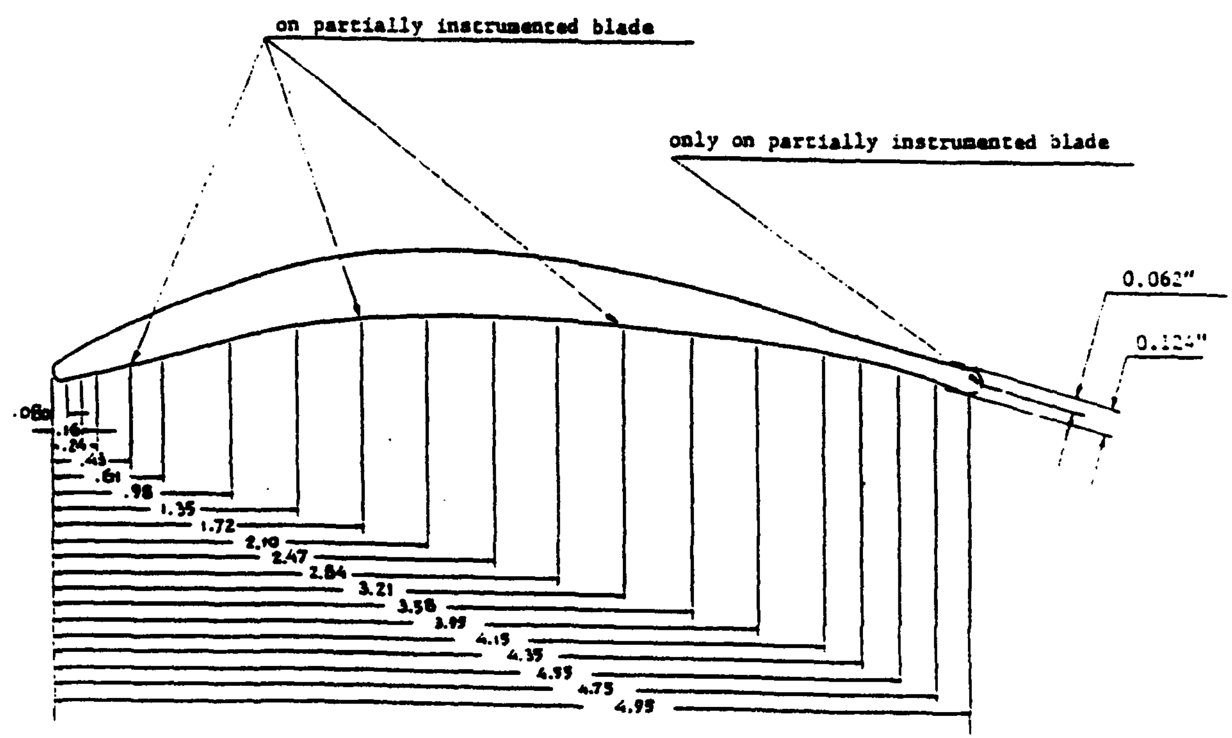


Figure 2. CD Blade Pressure Tap Locations on Pressure and Suction Sides

Figure 3. LDV System Installation

a. Laser and Optics

A four beam, two color TSI model 9100-7 LDV system was used. The laser was a Lexell four-Watt Argon-Ion laser which was operated nominally at 2 Watts in a multi-line mode. Two colors, green (514.5 nm) and blue (488 nm) were selected by the color separator. The two beams were centered and split into a four beam arrangement to measure two velocity components at right angles to each other. Two Bragg cells shifted the frequency of one beam in each pair to allow measurement of reverse flows. The four beams then passed through a divergence section which improved the dimensions measuring volume. Two photo-detectors collected the scattered light after it passed through the same optics. Table 1 contains a summary of the characteristics of the LDV system.

TABLE 1

CHARACTERISTIC	BLUE BEAM	GREEN BEAM
WAVELENGTH	488 nanometers	514.5 nanometers
FRINGE SPACING	4.51 microns	4.76 microns
FOCAL LENGTH	762 mm	762 mm
NUMBER OF FRINGES	28	28
HALF ANGLE	3.10 degrees	3.10 degrees
MEASURING VOL. DIAM	133 micro meter	133 micro meter
MEASURING VOL. LENG	2.5 mm	2.5 mm
FREQ. SHIFT (FIND)	+ 5 Mhz	+ 5 Mhz
BEAM SPACING	82.5 mm	82.5 mm
ORIENTATION	HORIZONTAL	VERTICAL
CHANNEL	2	1
FREQUENCY SHIFT	5 Mhz UP	5 Mhz DOWN

b. Data Acquisition

The data acquisition system consisted of two TSI Model 1990 counter-type signal processors and a 1998A Master Interface in which the signals from the photo-detectors were digitized. An oscilloscope attached to the input conditioner of the counters provided real-time display of the photomultiplier output. The digitized signals from the counters were send to an IBM PC in which the information was processed by

TSI proprietary software "FIND" version 4.0 . Through this software it was possible to position the LDV at programmed locations and automatically take measurements in surveys at any desired increment.

c. *Automated Traverse table*

The automated three-axis traverse was Model 9500 from TSI. The traverse used stepping motors for positioning the optical table which rested between the upper support arms. Digital encoders along each axis provided positioning accuracy to 0.0001 inch. The traverse and encoder interface to the PC used RS-232C protocol.

d. *Atomizer and Seeding Probe*

Olive oil was used as a seed material in a TSI atomizer which produced approximately 1 micro-meter sized particles as measured by Elazar [Ref. 5]. The seeding wand was adjustable, however, the adjustment was done on an arc, perpendicular to the tunnel, thus the seeding was not always at midspan. This limited the distance over which the pitchwise surveys could be extended. Figure 4 shows the atomizer and seeding probe.

Figure 4. Atomizer and Seeding Probe

III. EXPERIMENTAL PROCEDURE

A. PRESSURE MEASUREMENTS AND FLOW VISUALIZATION

Once the tunnel was set up at 50 degrees and running at a plenum pressure of 12 inches of water (approximately 700,000 Reynolds number), the pressure measurements were taken as specified by Classick [Ref. 2].

The flow visualization was carried out by projecting a laser sheet from the bottom left of the cascade to blade number 14, and while the tunnel plenum pressure was set at 12 inches of water (gauge), fog was introduced through one of the endwalls. The flow pattern of the fog between the blades was illuminated by the laser sheet. This process was performed at night for better visibility. The process was filmed ussing an 8mm video camera.

B. TUNNEL SET-UP AND TEST-SECTION CONFIGURATION

For the present study, the 50 degree inlet flow angle was set by adjusting the inlet guide vanes and side walls to equalize the endwall static pressures on both upstream walls. The exit flow angle was adjusted by setting the tailboards at angles which gave nearly uniform downstream wall static pressure measurements in the pitchwise direction across the cascade. The average inlet flow angle was measured, with the LDV, over three passage widths, 31.3% of an axial chord length upstream of the blade leading edge. Fine adjustments of the inlet guide vanes were made to achieve an average inlet flow angle (as measured by the LDV) of 50.21 degrees.

Previous LDV measurements were taken between blades 7 and 8 which were anodized black to minimize reflections. Because of the present inlet flow angle setting of 50.21 deg., blade 8 was too close to the edge of the window. Thus blade 8 and 6 were

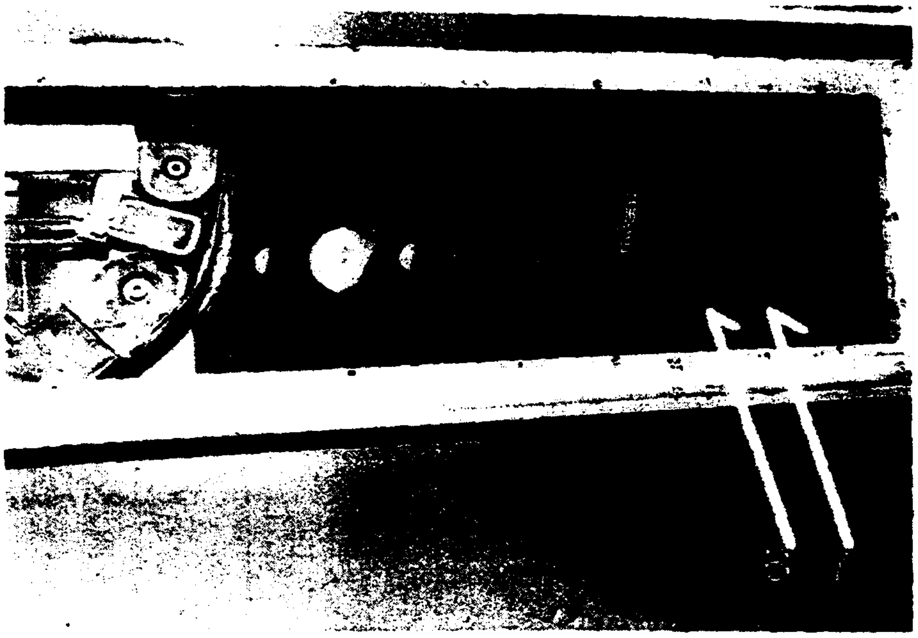


Figure 5. Anodized Blades

exchanged and all subsequent measurements during this study were taken between blades 6 and 7 as shown in Figure 5.

The tunnel reference velocity (Vref) was determined using the analysis of Elazar [Ref. 5]. At different tunnel speeds, the inlet flow velocity was measured (31.3% axial chord upstream) with the LDV, and the plenum pressure and temperature and ambient pressure were recorded. A least-squares curve fit was applied to the data to determine the calibration curve. During each subsequent run, the plenum and atmospheric conditions were recorded and used as input to a Newton method iteration algorithm to determine Vref. The result of this calibration is presented in Appendix E.

C. LASER SET-UP

The green beams of the laser were aligned vertically with the unshifted beam at the bottom and the blue beams were horizontal with the unshifted beam to the right , as shown in Figure 6. All surveys were conducted with the LDV optics "standard", i.e., the 488-nm blue beam measuring the horizontal velocity component (U), and the 514.5-nm green beam measuring the vertical velocity component (V). Down shifting was used in the following form; the green beam was downshifted by 5MHz and the blue beam was upshifted by 5MHz. The 1990 signal processors had the following settings: continuous (CONT) Mode; High Filter, 20MHz; Low Filter, 0.3MHz; Amplitude Limit, full counterclockwise; Cycles/Burst, 8; Comparison, 1 percent; Auto (green button), in; Voltage, External (EXT); Data Ready, Internal(INT); Gain, One (01); Resolution (No/SEC), 0ne (01). For the Data Interface Master; Coincidence Mode, Range X1 and Delta Interval 2 to the power 3 micro-seconds was used throughout this study.

In the Optics screen of the acquisition menu of FIND the frequency shift was set to +5MHz on both channels. As the maximum reverse flow Doppler frequency was approximately 1MHz this level of 5MHz downshifting allowed the determination of reverse flow velocities, both in the mean and intermittently. The determination of this final selection is shown in Appendix D.

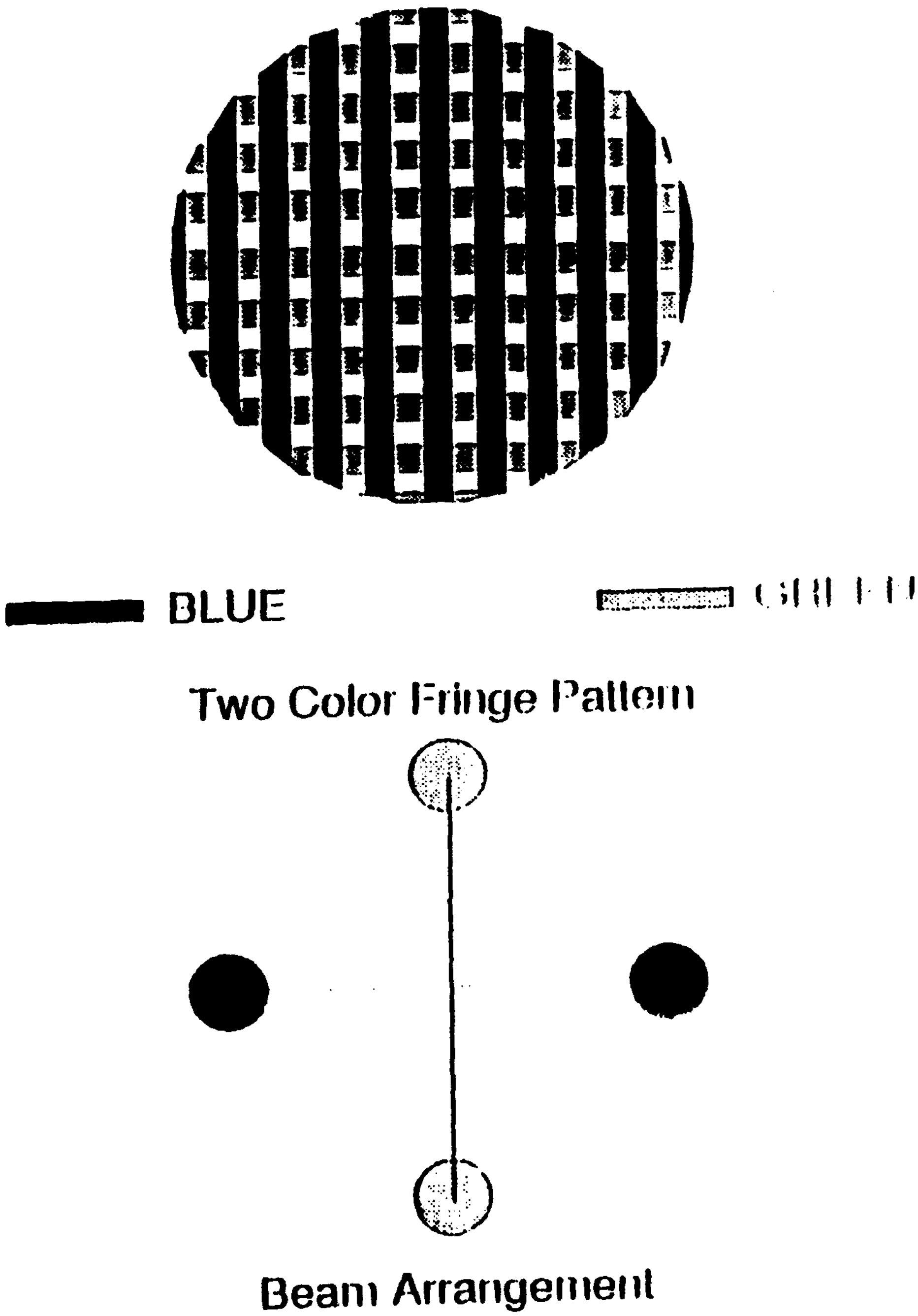


Figure 6. LDV Fringe Pattern and Beam Arrangement

D. SURVEYS

1. Inlet Surveys at 48 and 50 Degrees

All LDV measurements presented herein were averaged over 3000 data points, and plus or minus 2 Standard Deviation histogram editing was performed for the flowfield distribution plots. The edited histograms were used to determine the edge of the separation and reverse flow regions.

The initial pitchwise survey at station 1 (Figure 7) was conducted over three passage widths to determine the flow periodicity. All subsequent inlet pitchwise surveys were traversed over a 4 in. distance, spanning the region of maximum seeding. The first three inlet surveys, at stations 1, 1a and 1b, were carried out with the LDV horizontal. Station 1b was repeated with the laser pitched upwards by 4 deg. The need for pitching was to allow for closer access to the leading edge, i.e., so that there would not be any blade shadow interference at the subsequent stations 1c-1e. At any time during the experiment, if the laser was either pitched or yawed, then the previous survey would be repeated to enable the determination of any errors due to the measurement volume orientation. The maximum spatial error, due to probe volume orientation, was calculated by Hobson and Shreeve [Ref. 1] to be 0.3mm. This error was because the probe volume was not parallel to the blade span, and therefore seed particles displaced from the actual measurement location could be measured. The location of the measurement volume was always referenced to the same location between the blades throughout the study. The alignment procedure is described by Elazar [Ref. 5].

2. Passage Surveys at 50 Degrees

Measurements were taken only on the suction side, over a two inch pitchwise distance. Figure 7 shows the positions for the passage surveys and each dot on the figure represents a measurement location. These dots were stretched away from the surface to approximate a boundary layer survey. The passage surveys (between blades 6 and 7) were conducted with the same LDV optics configuration specified for the inlet surveys. In addition, the LDV was yawed by 4 deg to the left and pitched upward by 2 deg to avoid

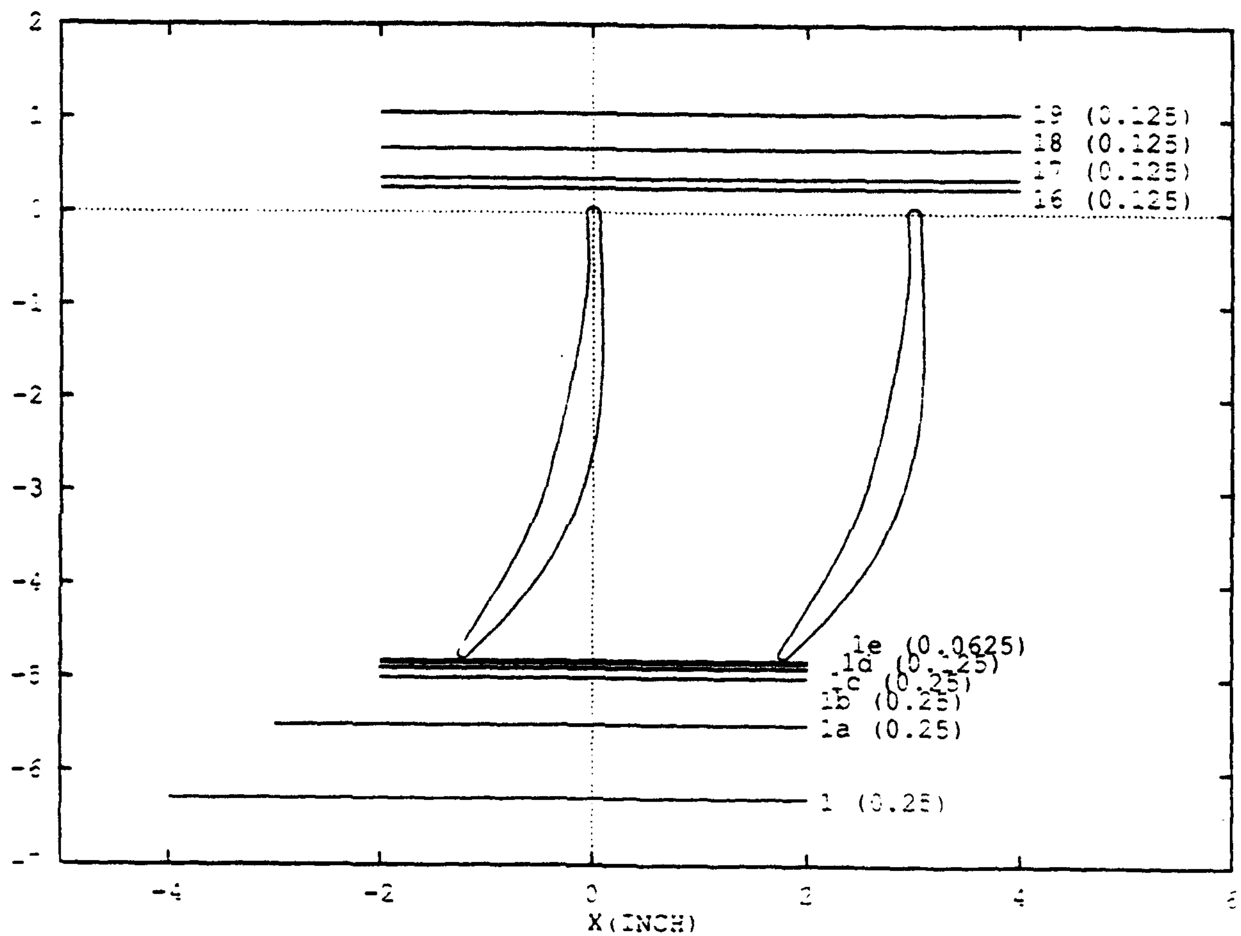


Figure 7. Inlet and Exit Pitchwise Survey Locations

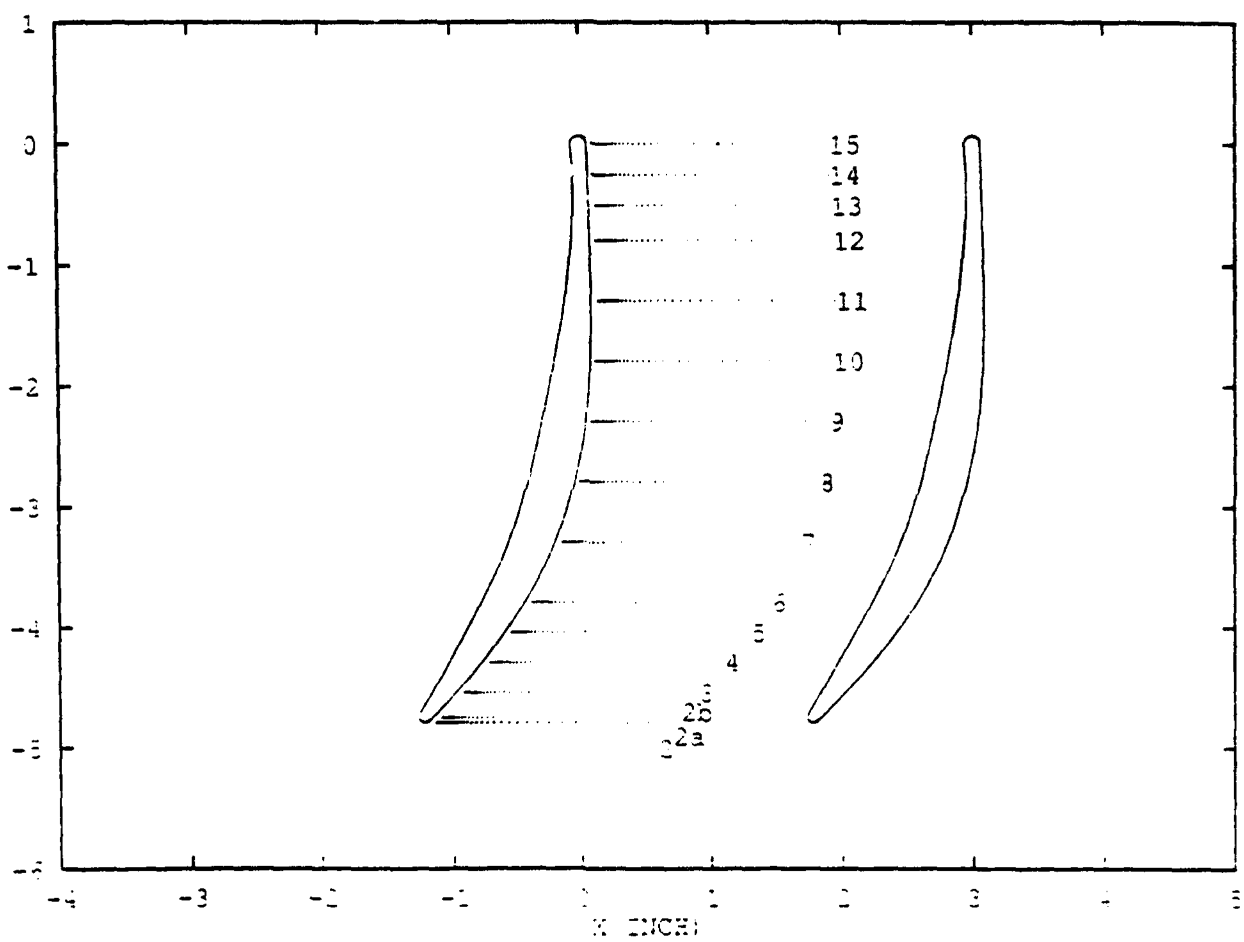


Figure 8. Suction Side Passage Survey Locations

the laser beams being shadowed by the blade. This was done for the suction side close to the leading edge, from station 2 to 7. At stations 7 to 15 the LDV was only yawed by 4 deg.

3. Wake Surveys at 50 Degrees

Wake surveys (between blades 6 and 7) were conducted with the same LDV optics configuration specified for the inlet surveys. The LDV was horizontal and perpendicular to the tunnel for stations 16 to 19 and the surveys were performed over two passage widths (6 inches). Figure 7 shows the positions for the wake surveys.

IV. RESULT AND DISCUSSION

A. BLADE SURFACE PRESSURE MEASUREMENTS

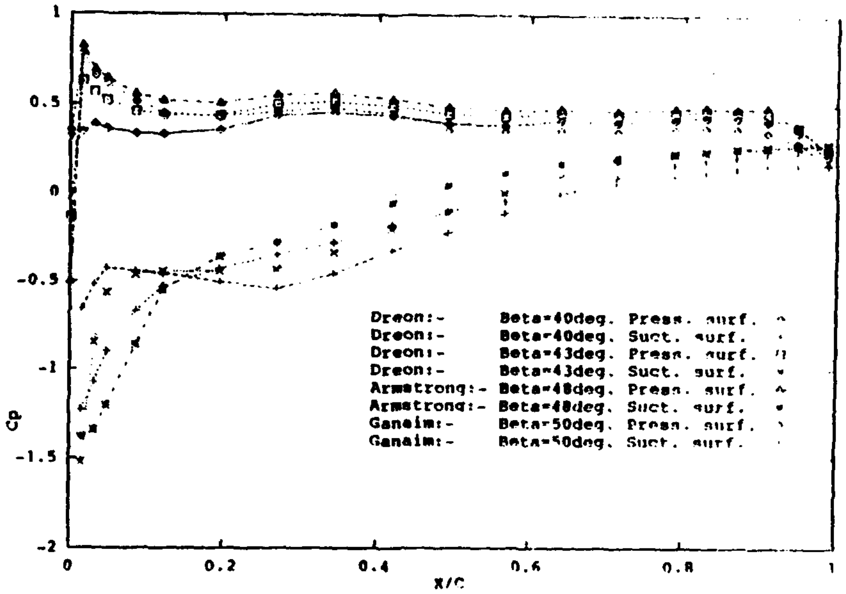
The upper plot of Figure 9 shows the blade surface pressure distribution measured by Dreon [Ref. 6] at 40 and 43 degrees, Armstrong [Ref. 7] at 48 degrees and the present work at 50 degrees. The integration of the area within the pressure distributions for each angle gave the Normal Force Coefficient. The lower plot (Normal Force Coefficient versus Angle of Attack) shows a drop-off in force (or lift) at 50 degrees, consistent with the observation that the cascade had entered into stall.

B. INLET SURVEYS (STATIONS 1 THROUGH 1E)

Figures 10 through 15 show the horizontal (U), vertical (V) components and the total velocity (Utot) distributions in the pitchwise direction ahead of the blades. At station 1, a disturbance in the total velocity profile is evident which is periodic and three inches apart. This disturbance corresponds to the spacing of the blades and thus the presence of the blades is now felt 30% of an axial chord ahead of the leading edges. This magnitude of upstream disturbance, was not evident at lower inlet air angles.

Station 1A (Fig. 11) shows measurement anomalies on the U component which are due to imperfections in the acrylic window. In subsequent figures (12 through 15) the total velocity (Utot) decreased as the flow approached the leading edge of blade number 6 and then increased again as the flow rounded the leading edge of the blade.

The final inlet profile (Fig. 15) shows a variation in total velocity of 40% (from 1.0 to 0.6) across the leading edge. This variation is less than that previously measured at 48 degrees inlet air angle (> 50% variations), and this too is an indication that stall had occurred.



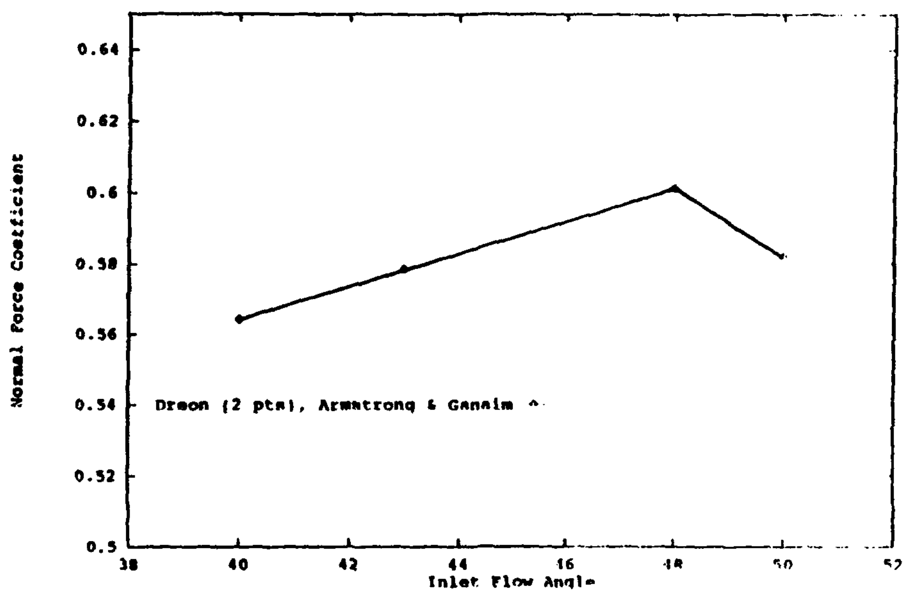


Figure 9. Pressure Distribution and Normal Force Coefficient

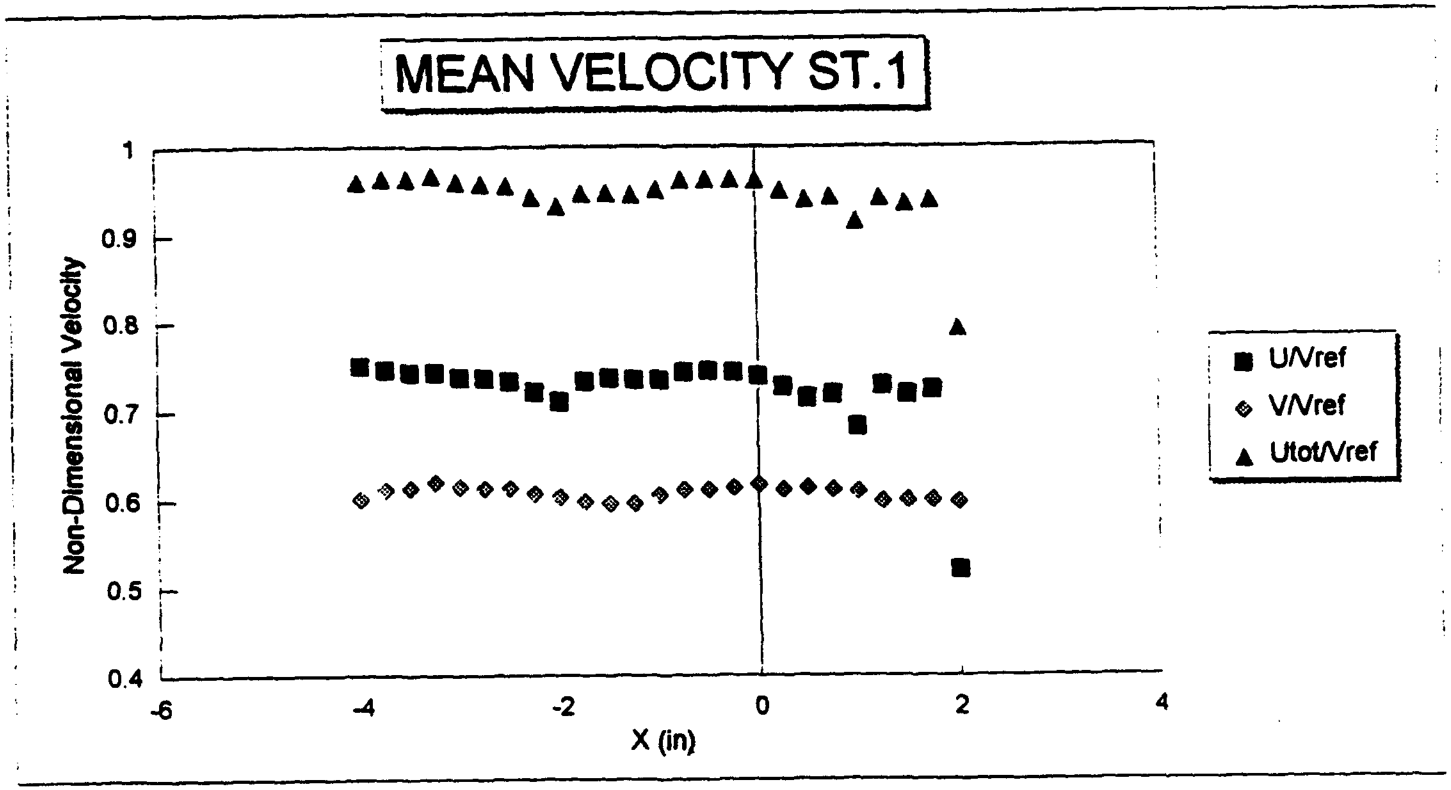


Figure 10. Survey at Station 1

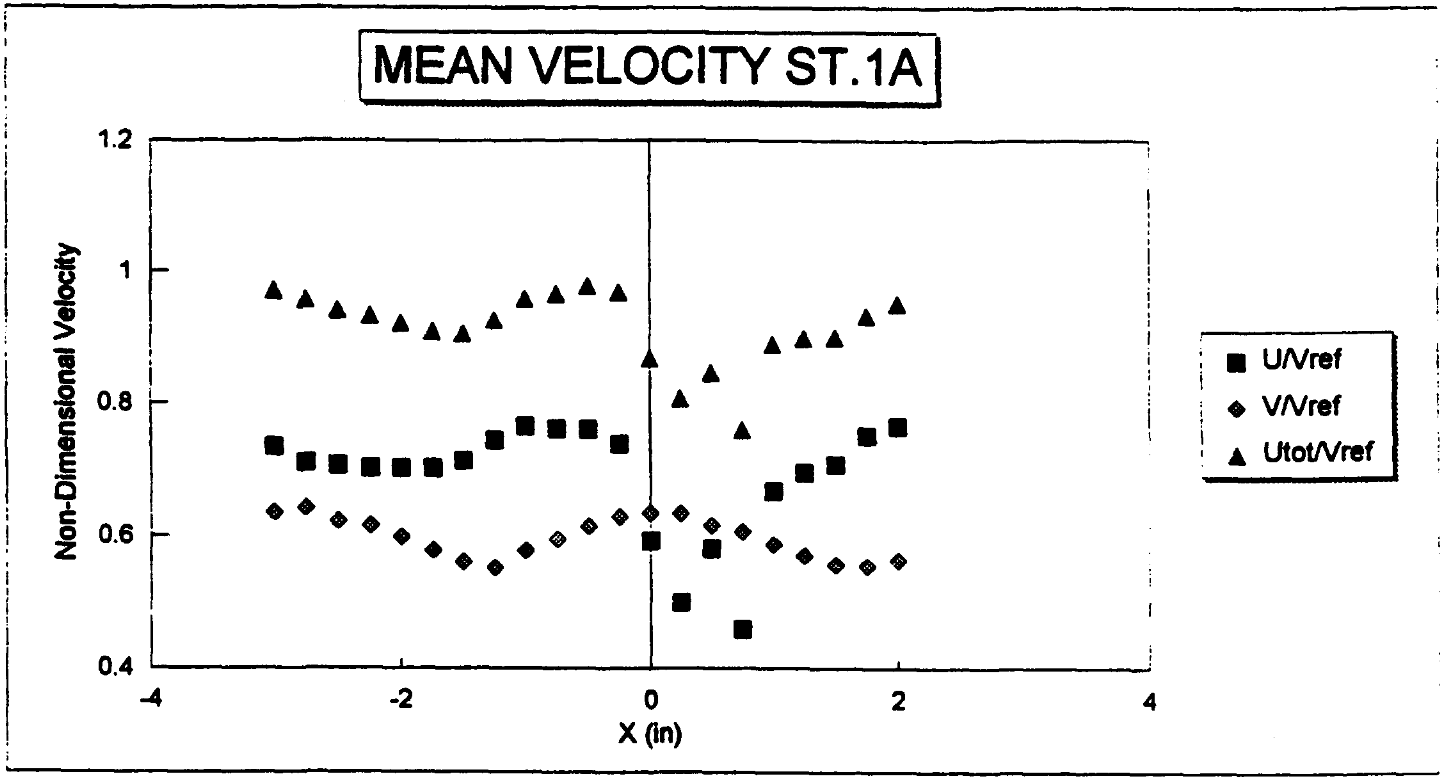


Figure 11. Survey at Station 1A

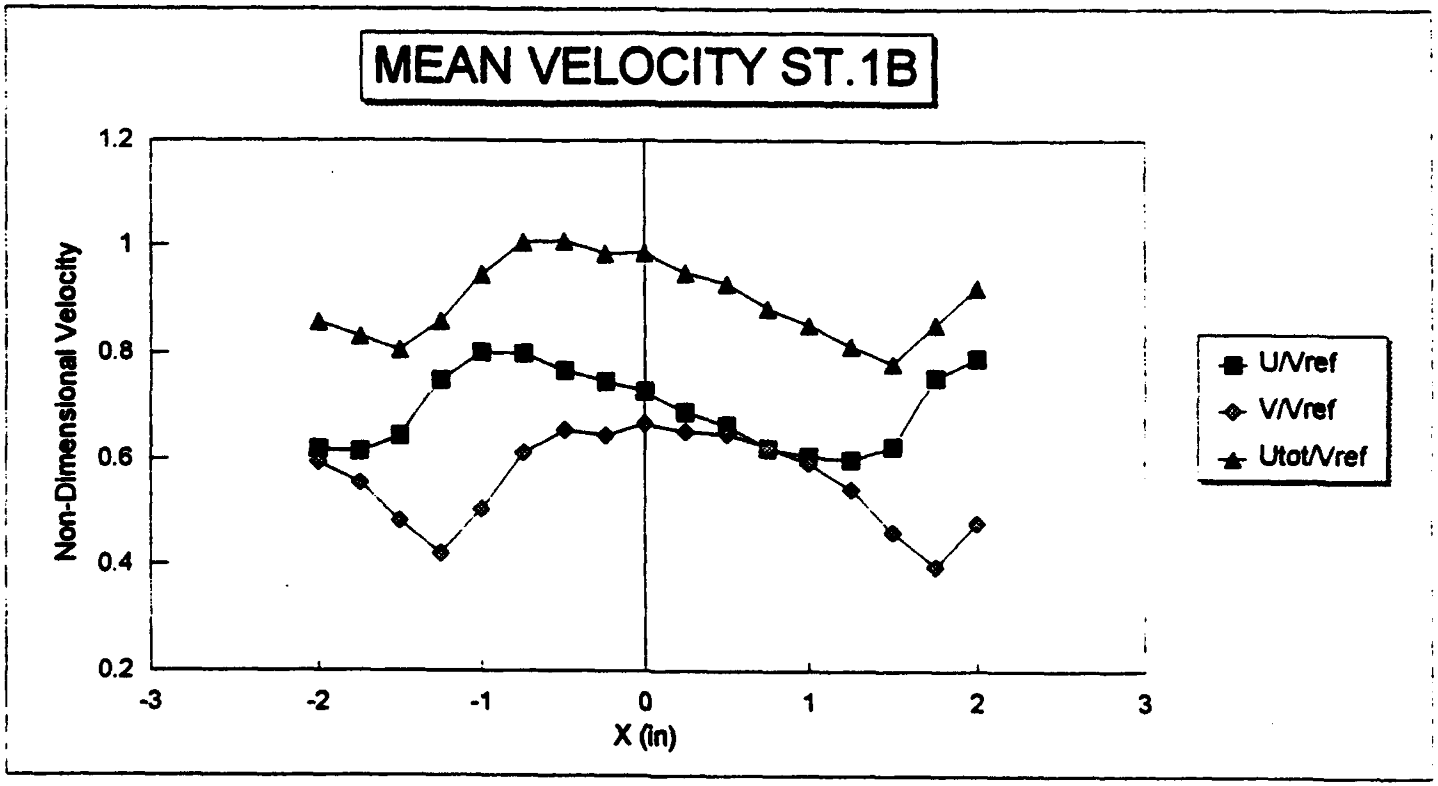


Figure 12. Survey at Station 1B

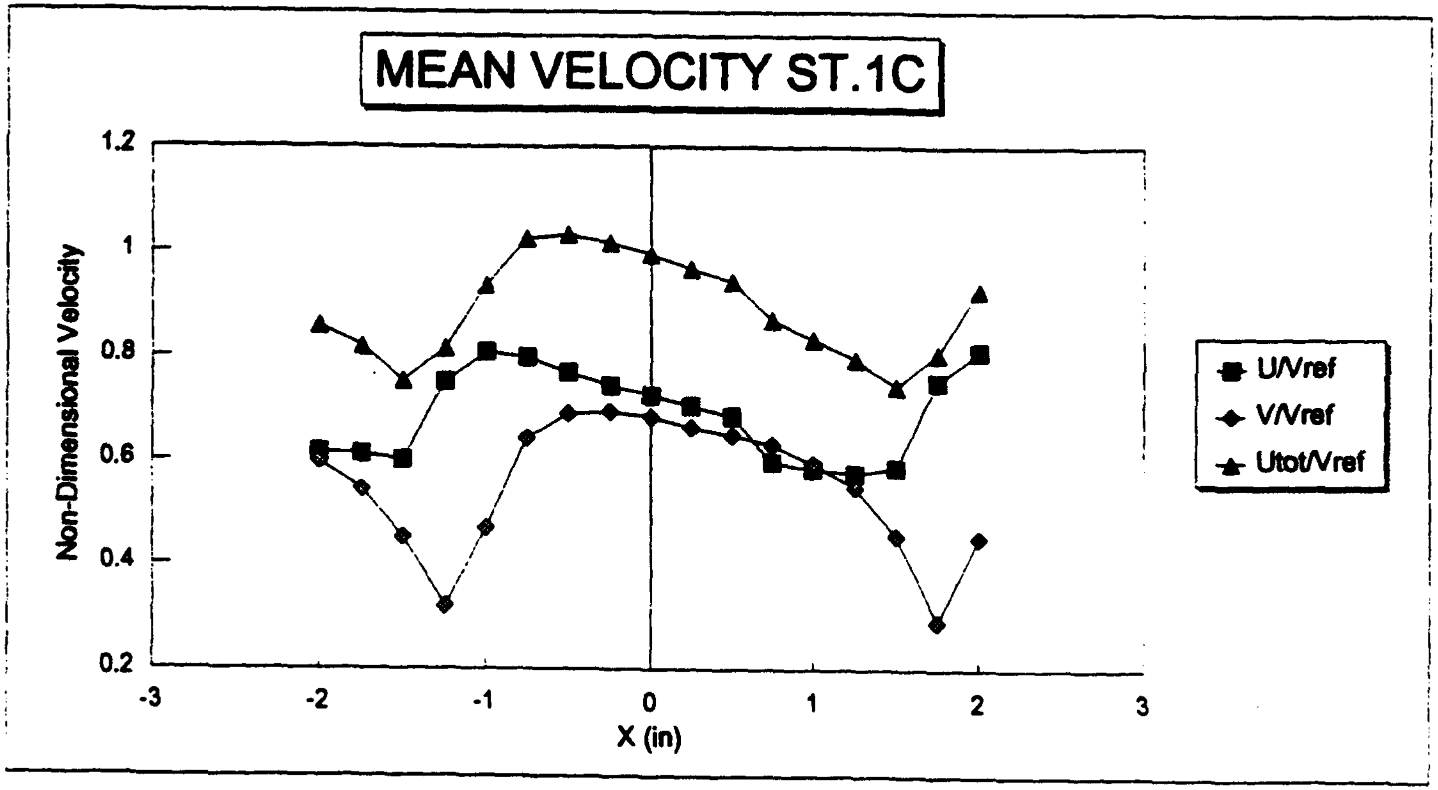


Figure 13. Survey at Station 1C

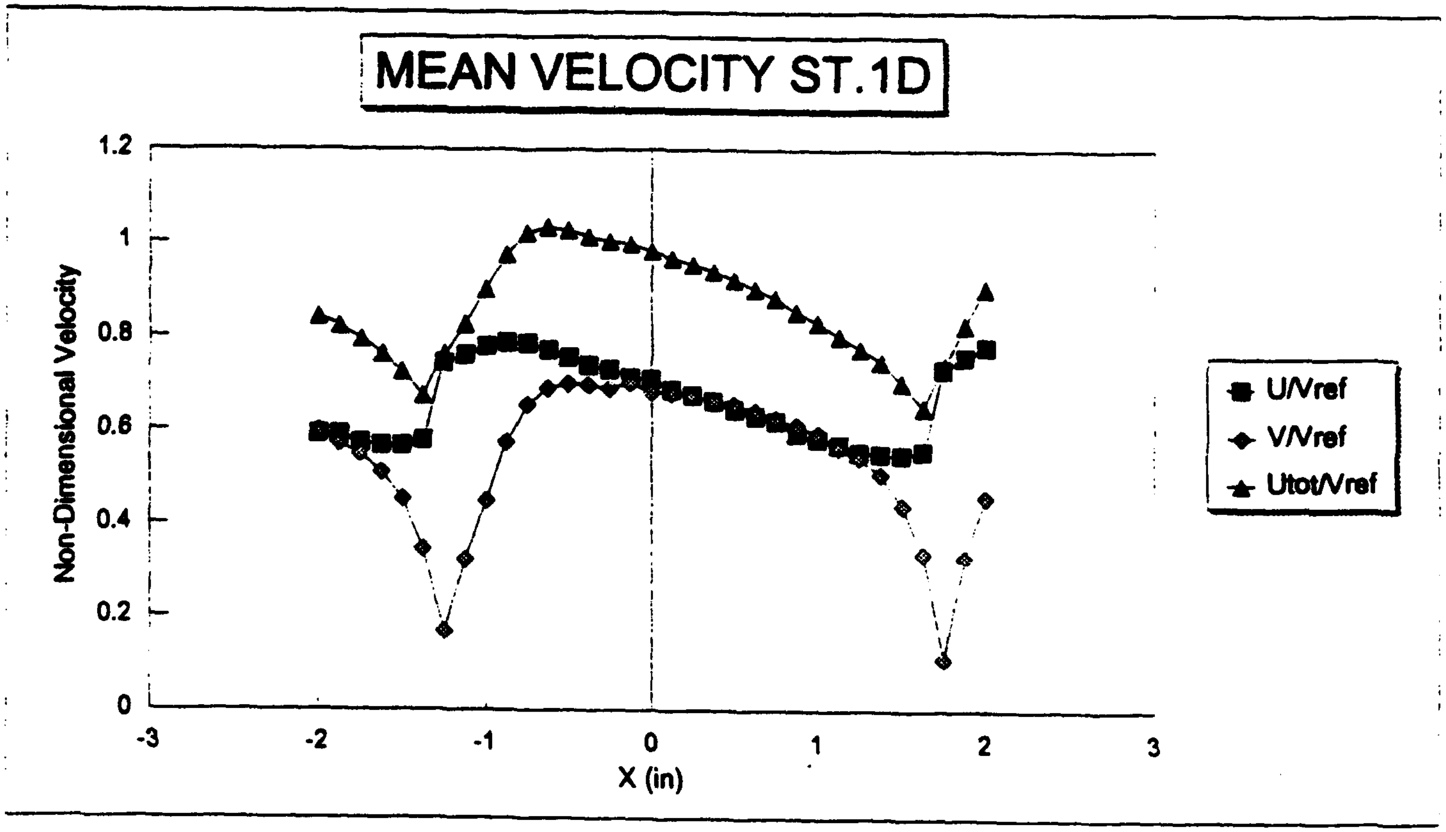


Figure 14. Survey at Station 1D

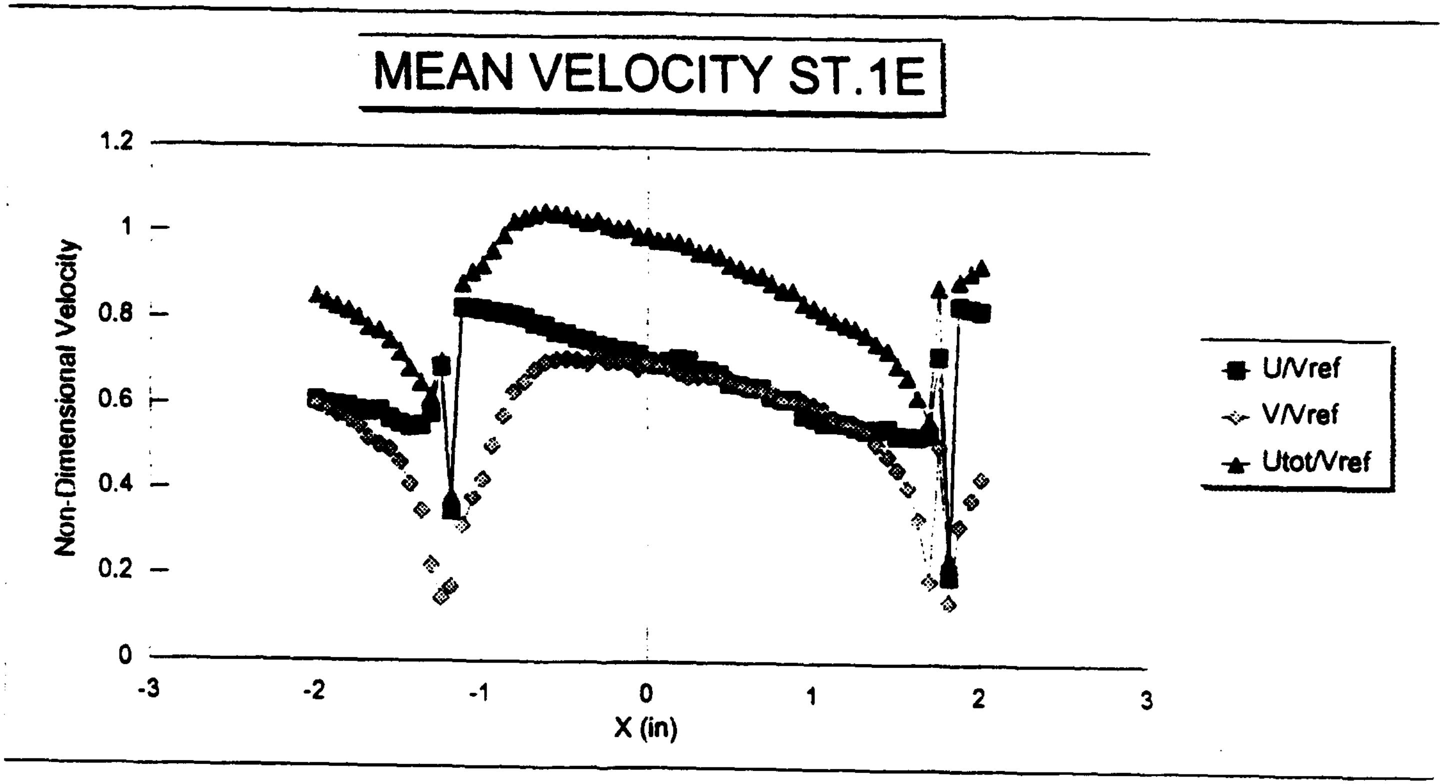


Figure 15. Survey at Station 1E

C. PASSAGE SURVEYS (STATIONS 2 THROUGH 15)

At station 2 only forward moving particles were measured, and the mean velocities (both U and V components) were all positive (Fig. 16). The discontinuity in the V/Vref profile between points 11 and 12 was unexplained. At station 2A the magnitude of the first data point dropped off significantly (Fig. 17). Upon examination of the histograms for the vertical velocity component it was found to contain reverse flow particles, which indicated that this region had intermittent reverse flow. The first data point at station 2B had a negative mean V velocity and a positive mean U velocity (Fig. 18), and this indicated the beginning of the leading edge reverse flow region (i.e., negative mean velocity on V). The following 5 data points had intermittent reverse flow histograms.

At station 3 the first three data points had negative mean velocities, both U and V, and then the following 7 data points had intermittent reverse flow particles. Station 4 only had intermittent reverse flow particles (no histograms with a negative mean) for the first 6 data points. The discontinuity in the profile as shown in Figure 20 illustrated the change over from intermittent reverse flow to all positive, or forward-moving particles. The profile at station 5 (Fig. 21) was very similar to that at station 4.

At station 6 (Fig. 22) the first two points showed only forward moving particles, the third data point had intermittent reverse flow, the next five data points were all positive and the ninth data point again had intermittent reverse flow. All other data points beyond the tenth point had histograms with only positive values. The first data point at station 7 (Fig. 23) only had positive moving particles, the second through sixteenth data points showed intermittent reverse flow and then all higher points were positive.

The first data point at station 8 (Fig. 24) had only positive particles, the next 17 data points showed intermittent reverse flow, and then all the points showed only positive flow. The mean flow profile once again showed a significant discontinuity in that region.

Stations 9 through 15 (Figs. 25 through 31) were similar in that they all showed regions of intermittent reverse flow close to the suction surface of the blade followed by the core flow where all the measured particles had positive velocity components.

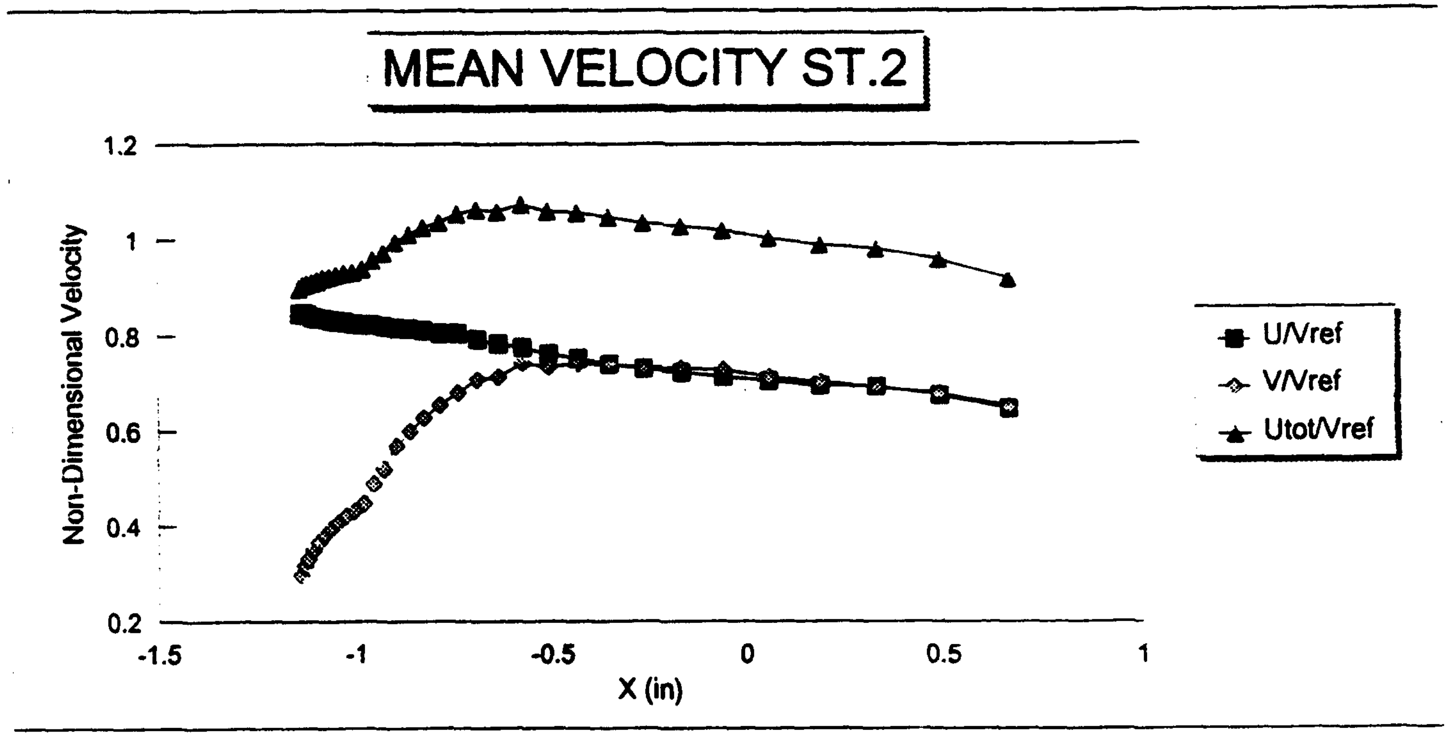


Figure 16. Survey at Station 2

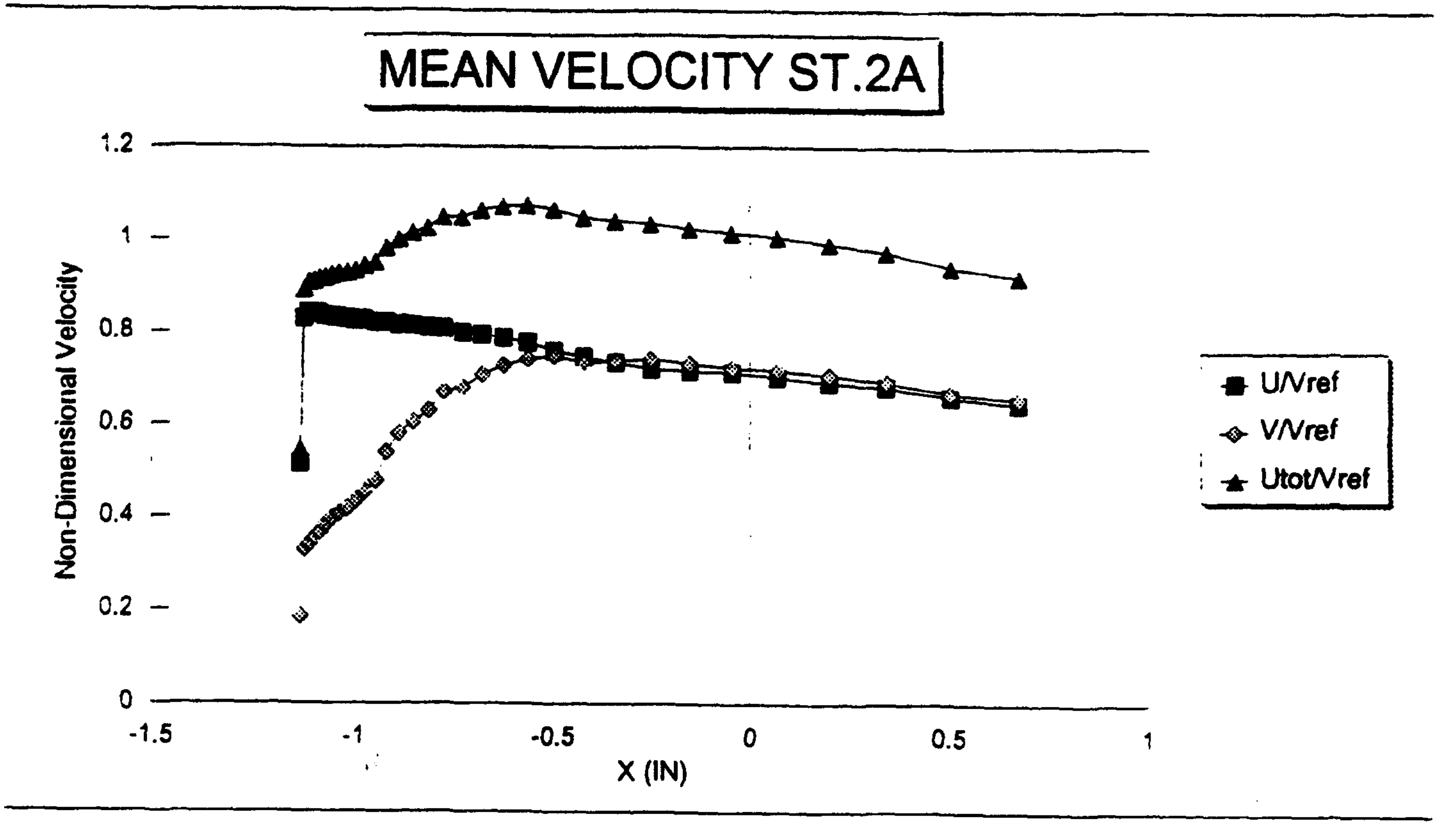


Figure 17. Survey at Station 2A

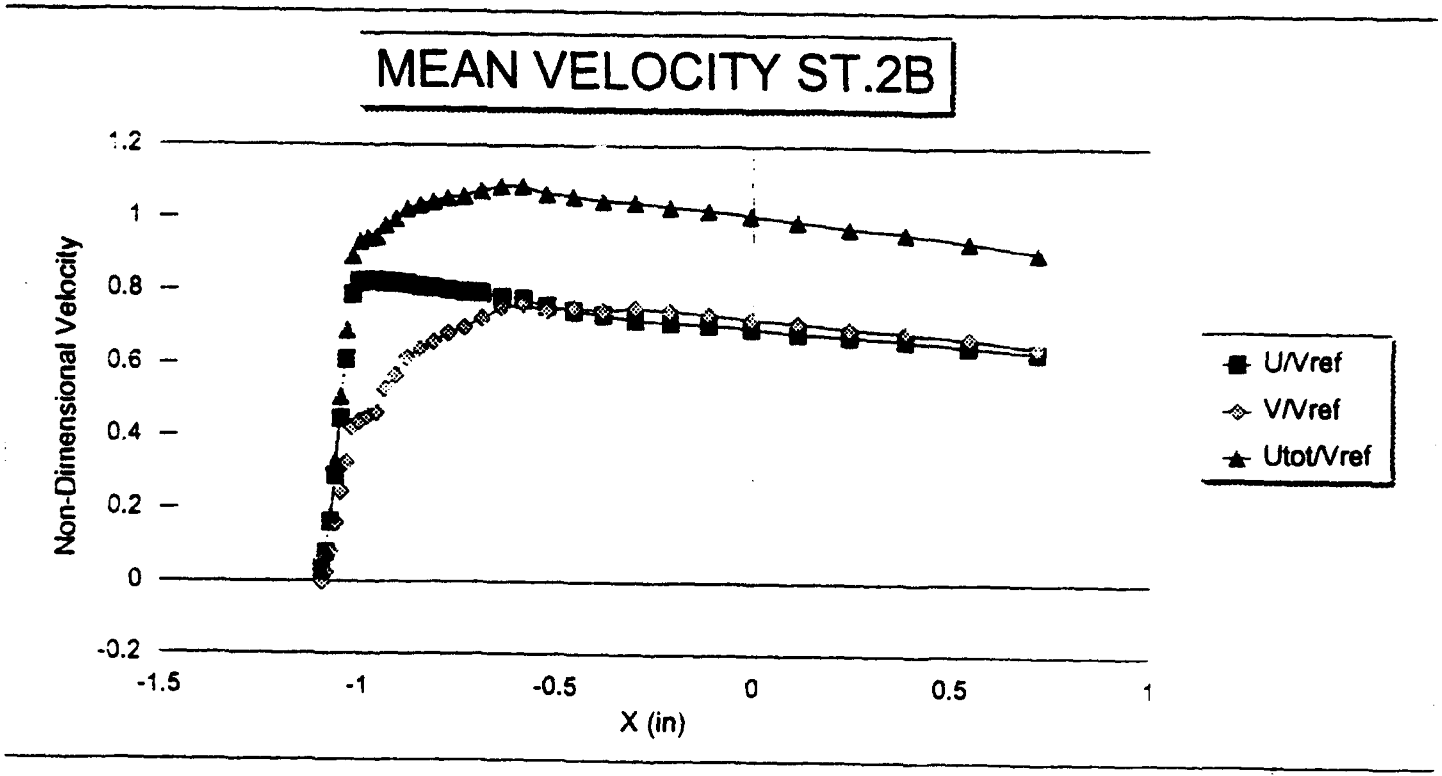


Figure 18. Survey at Station 2B

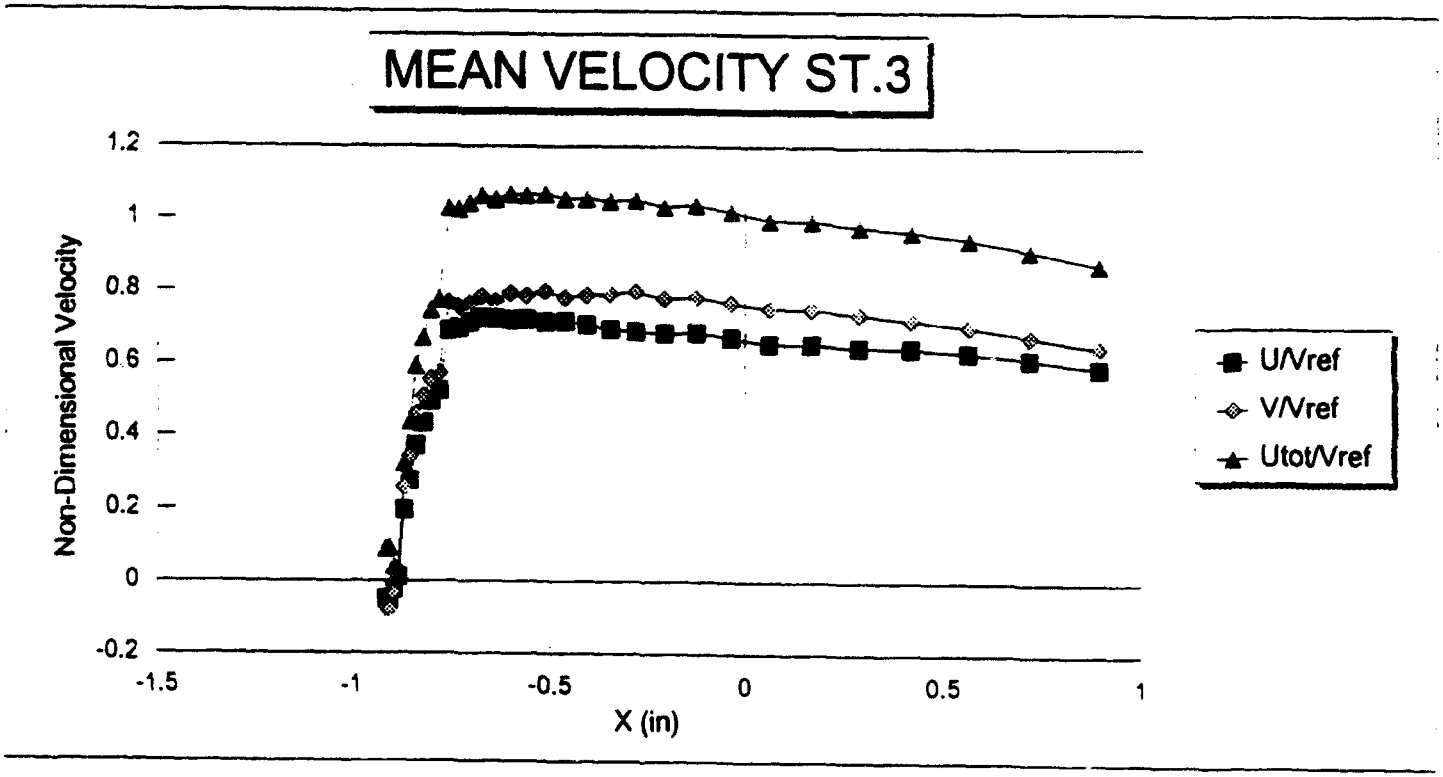


Figure 19. Survey at Station 3

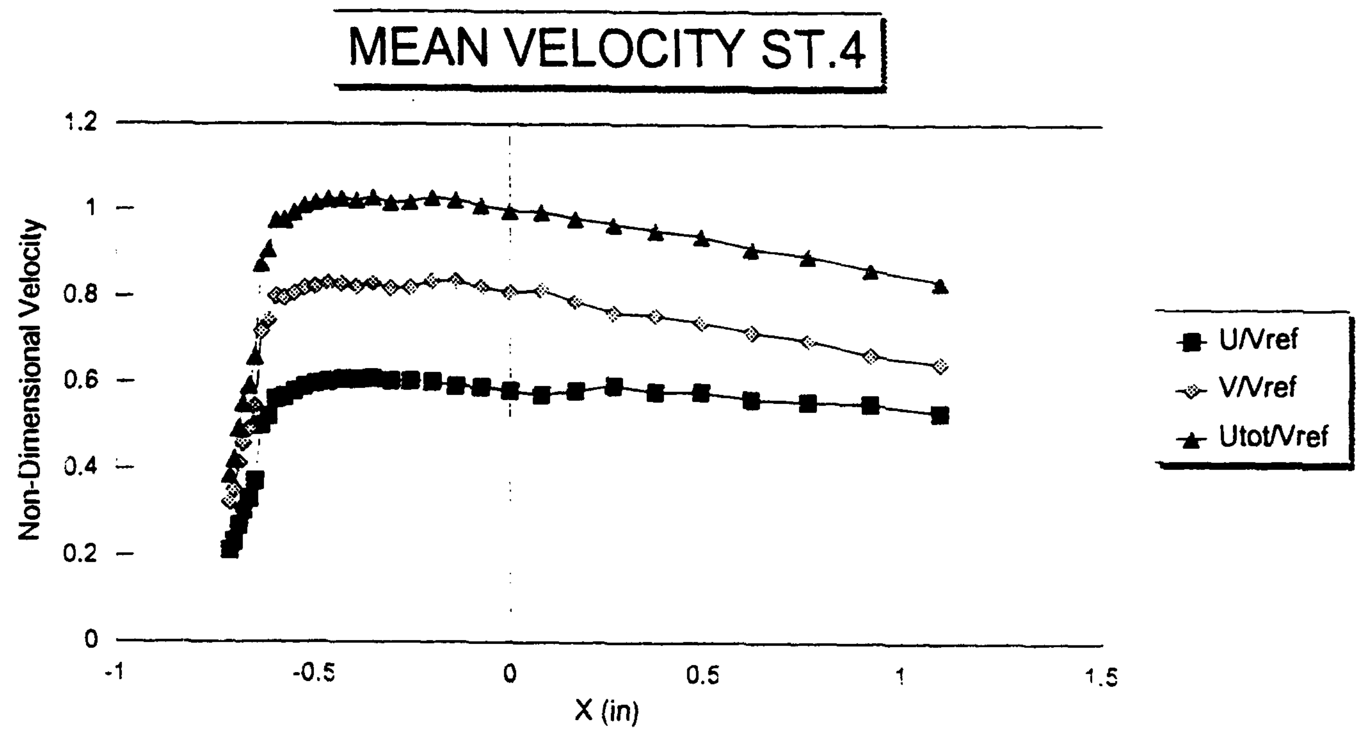


Figure 20. Survey at Station 4

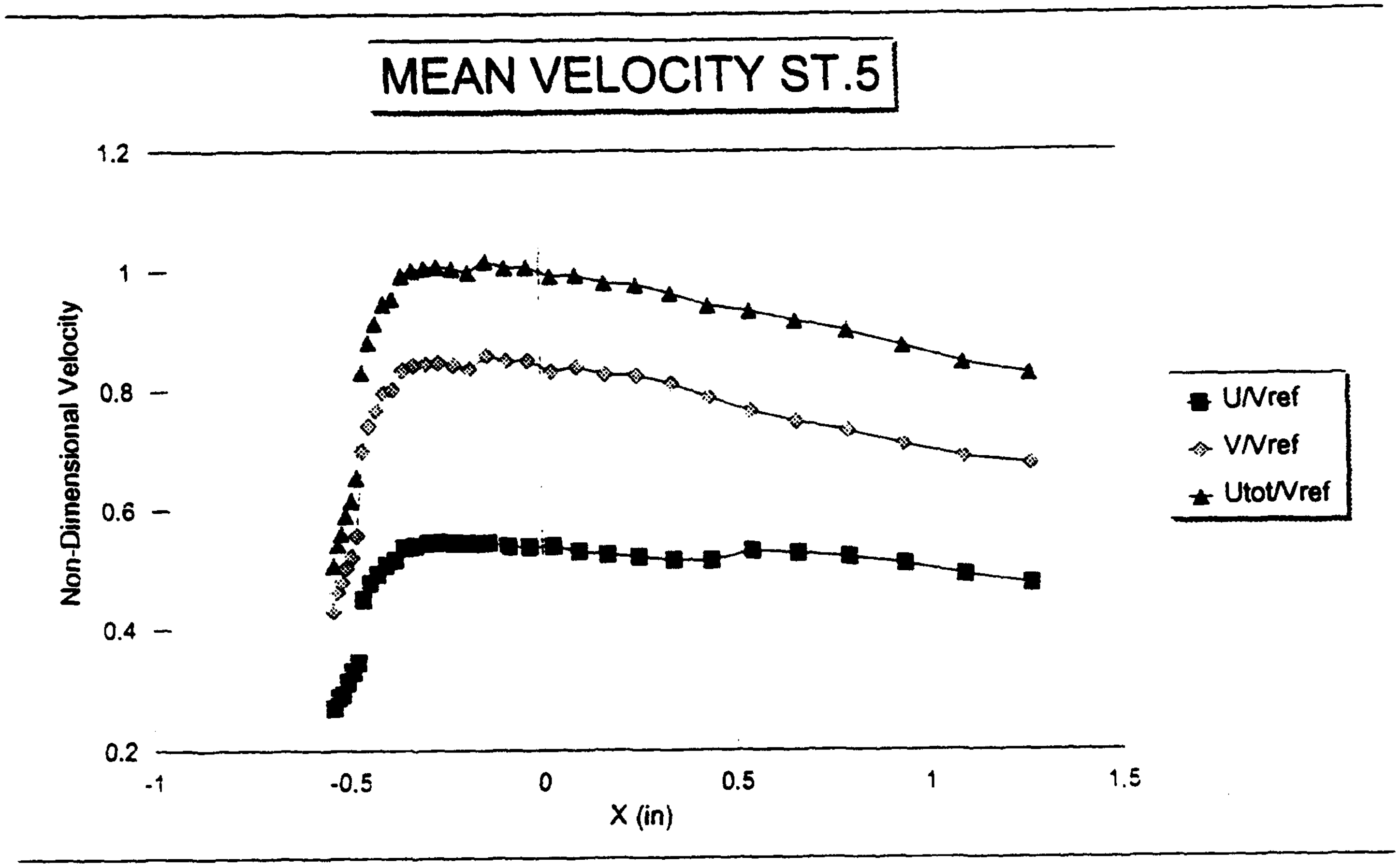


Figure 21. Survey at Station 5

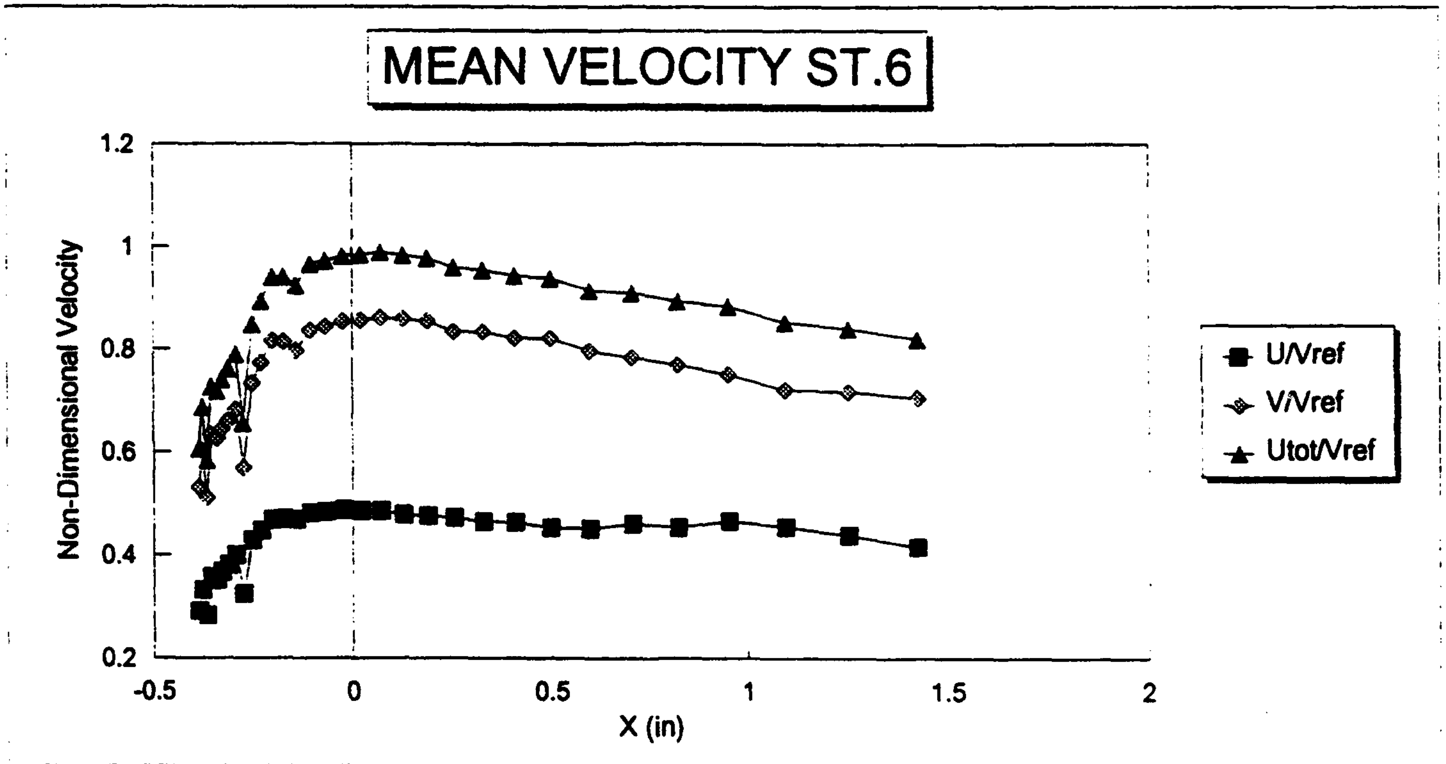


Figure 22. Survey at Station 6

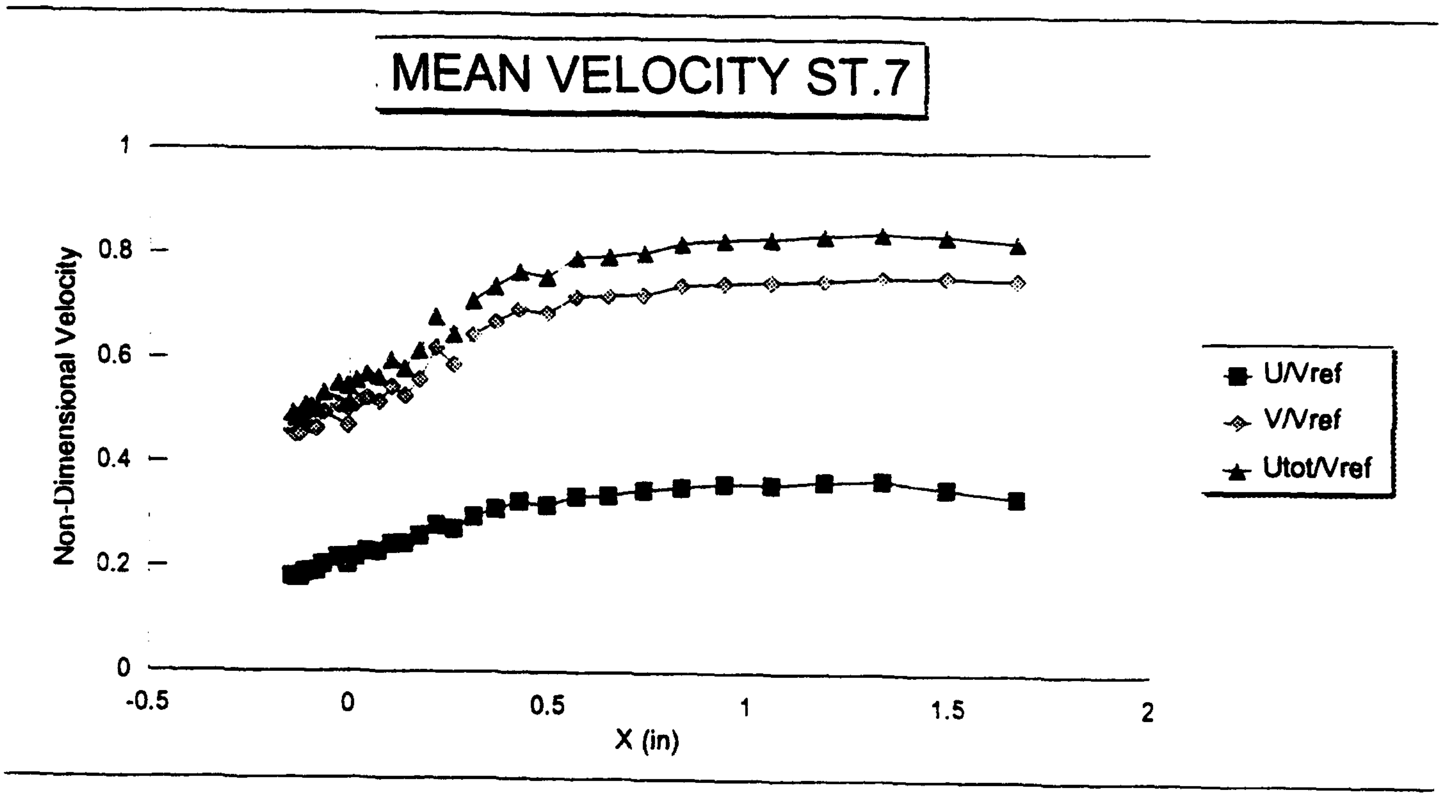


Figure 23. Survey at Station 7

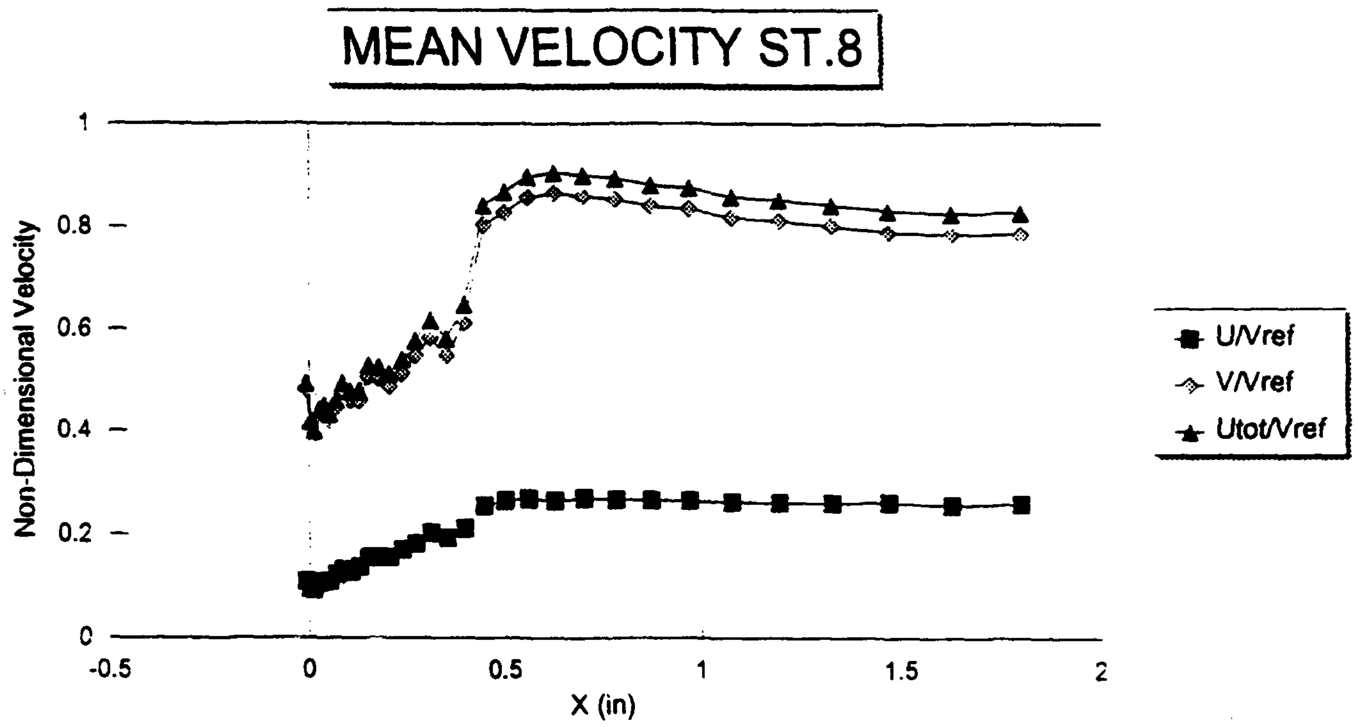


Figure 24. Survey at Station 8

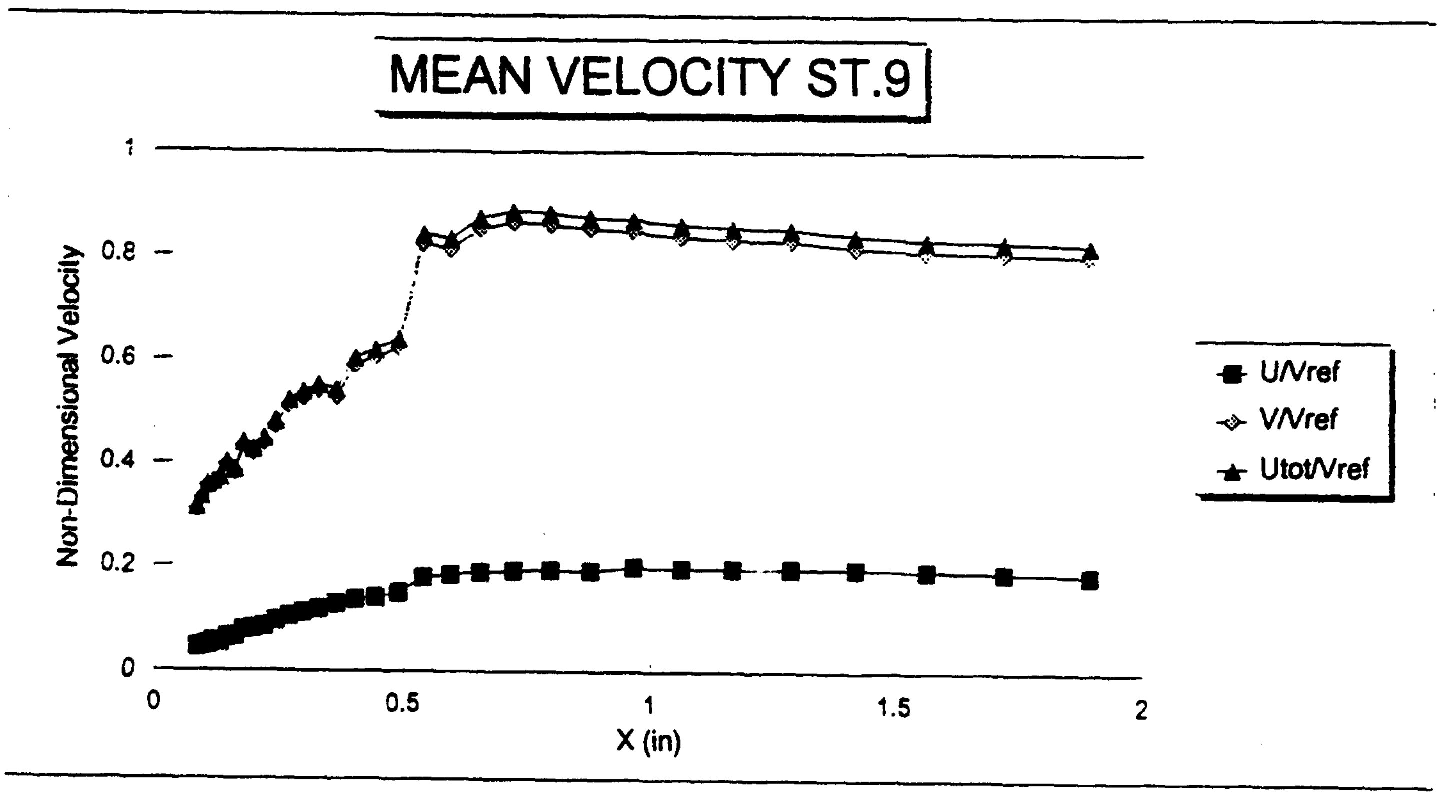


Figure 25. Survey at Station 9

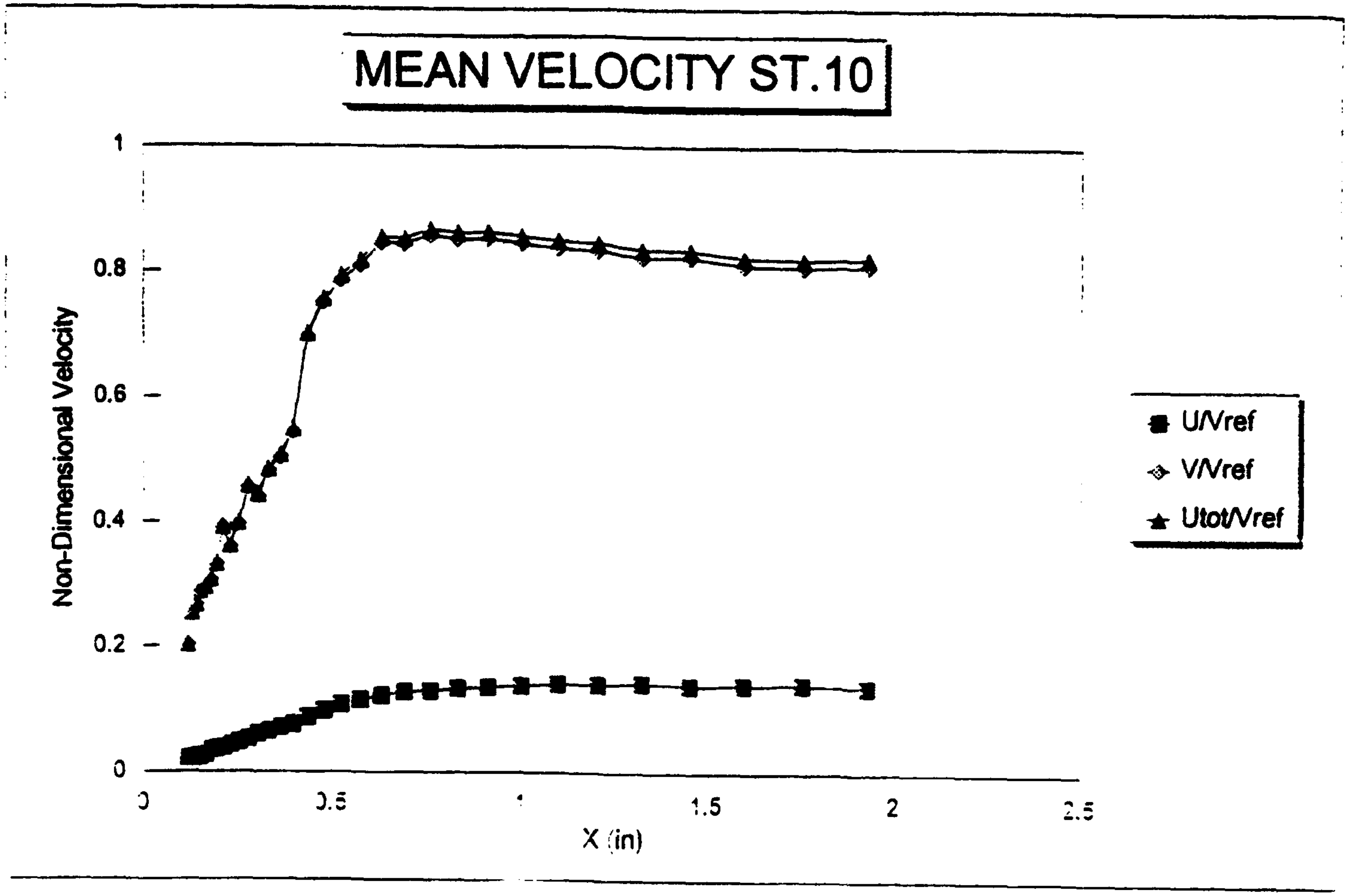


Figure 26. Survey at Station 10

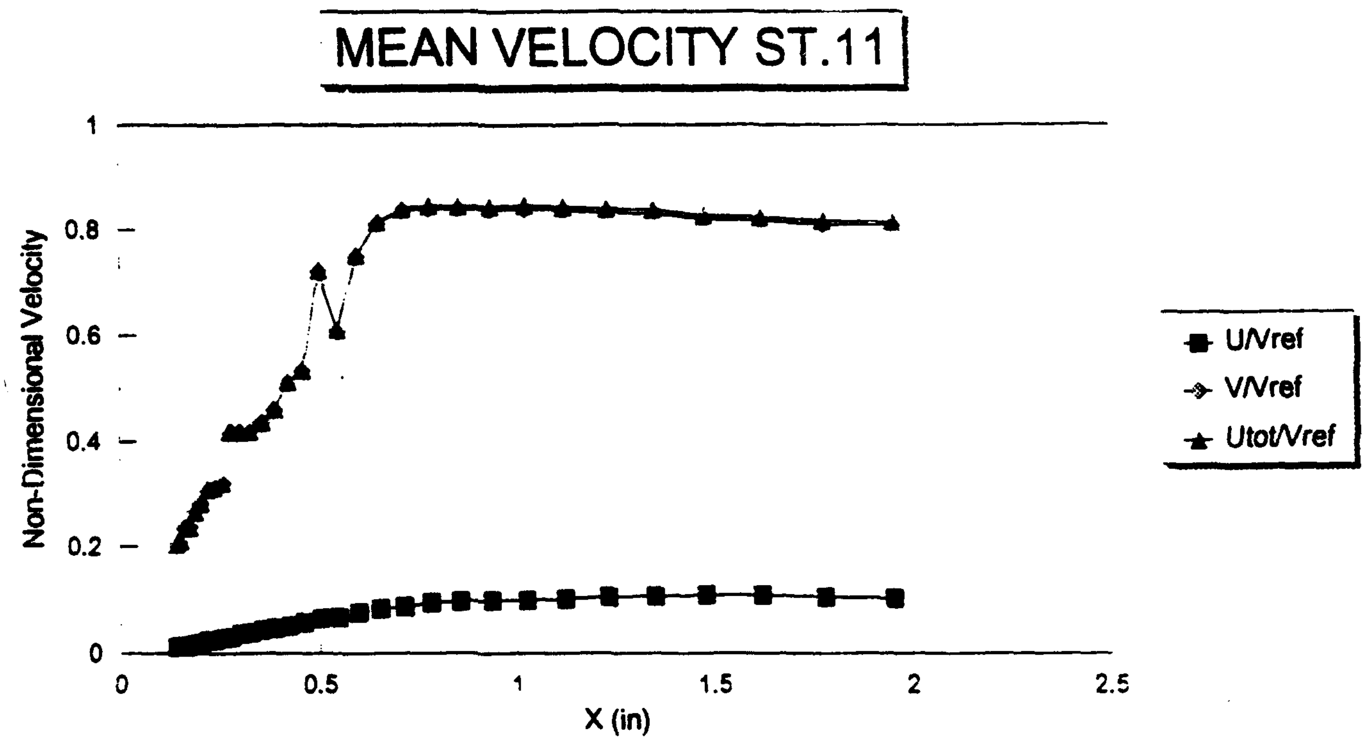


Figure 27. Survey at Station 11

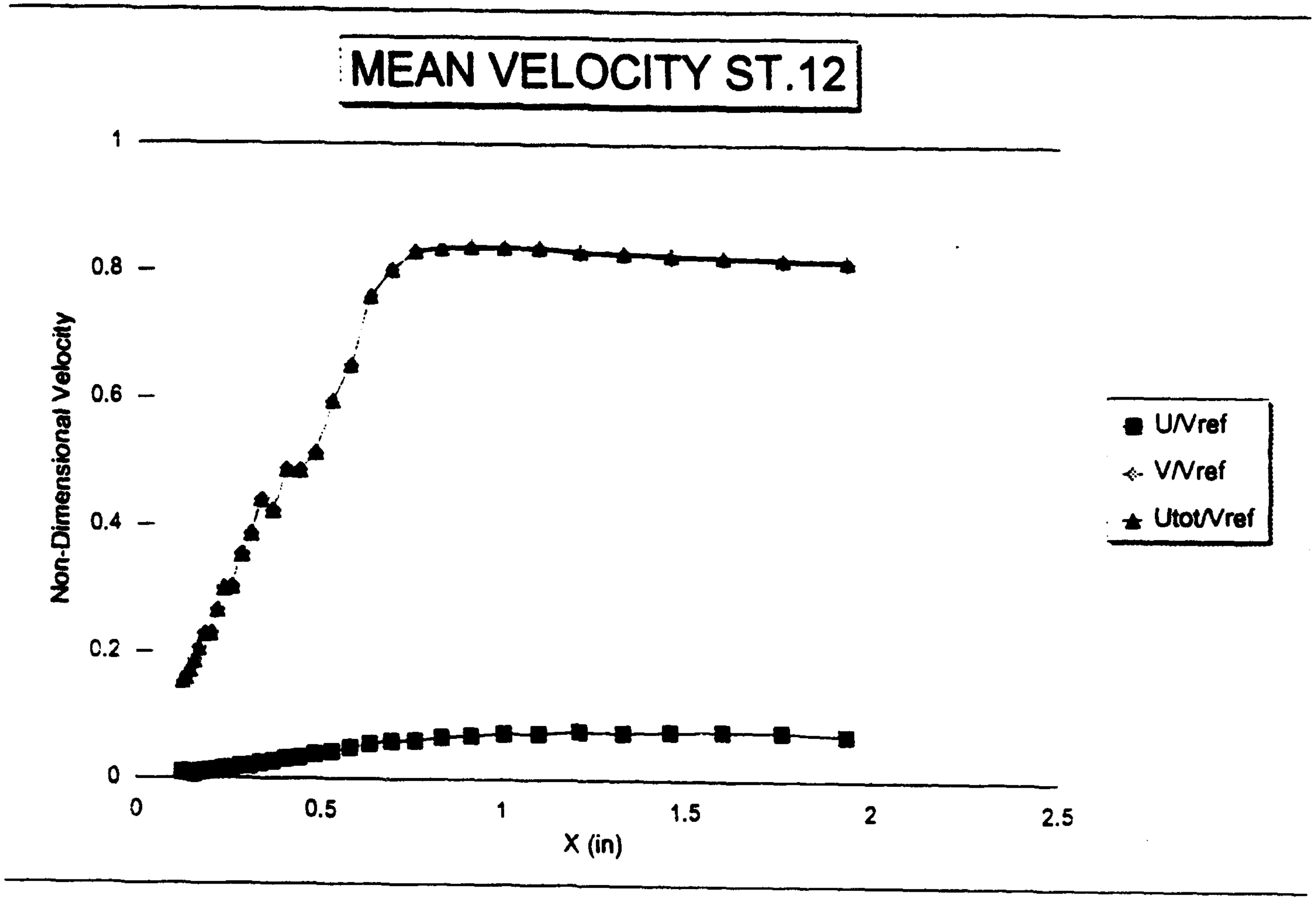


Figure 28. Survey at Station 12

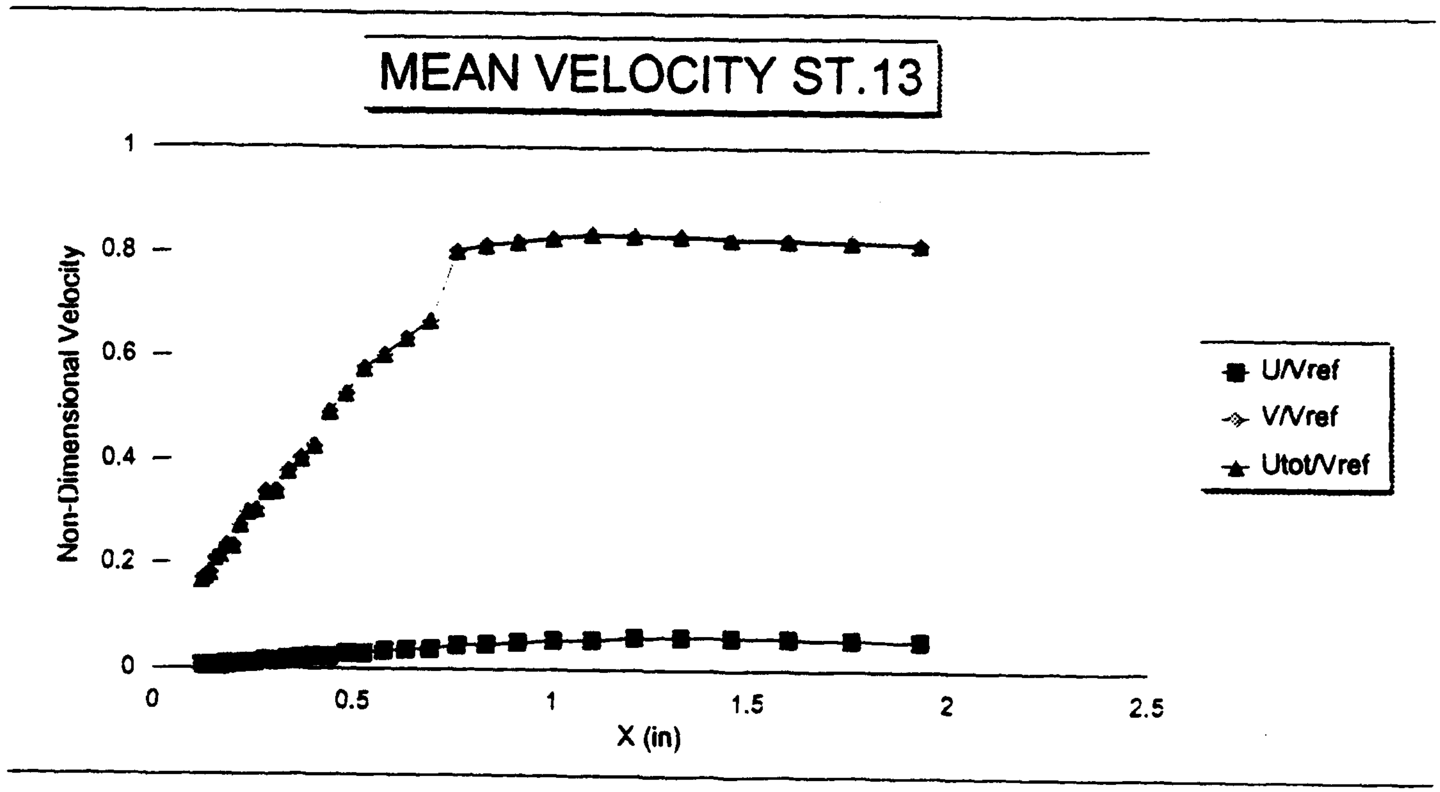


Figure 29. Survey at Station 13

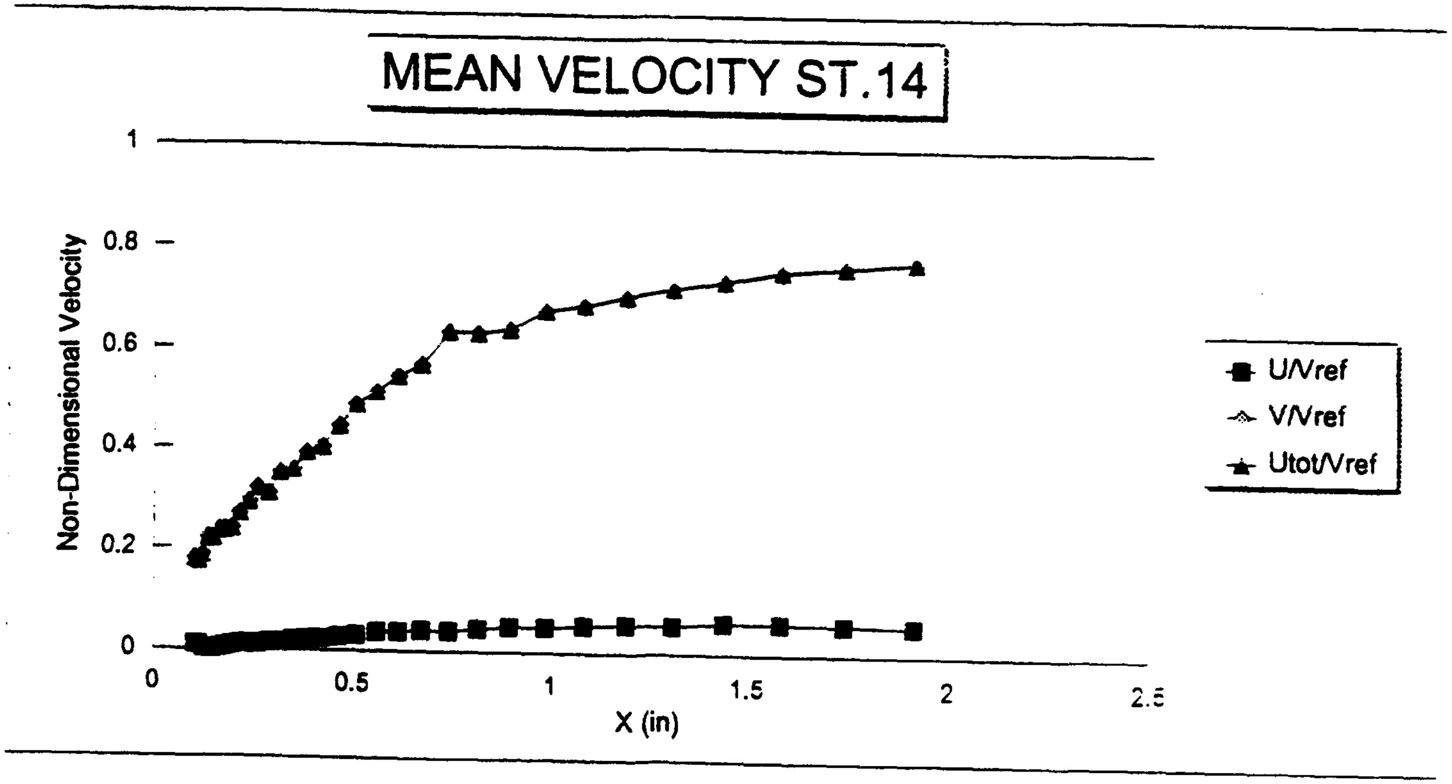


Figure 30. Survey at Station 14

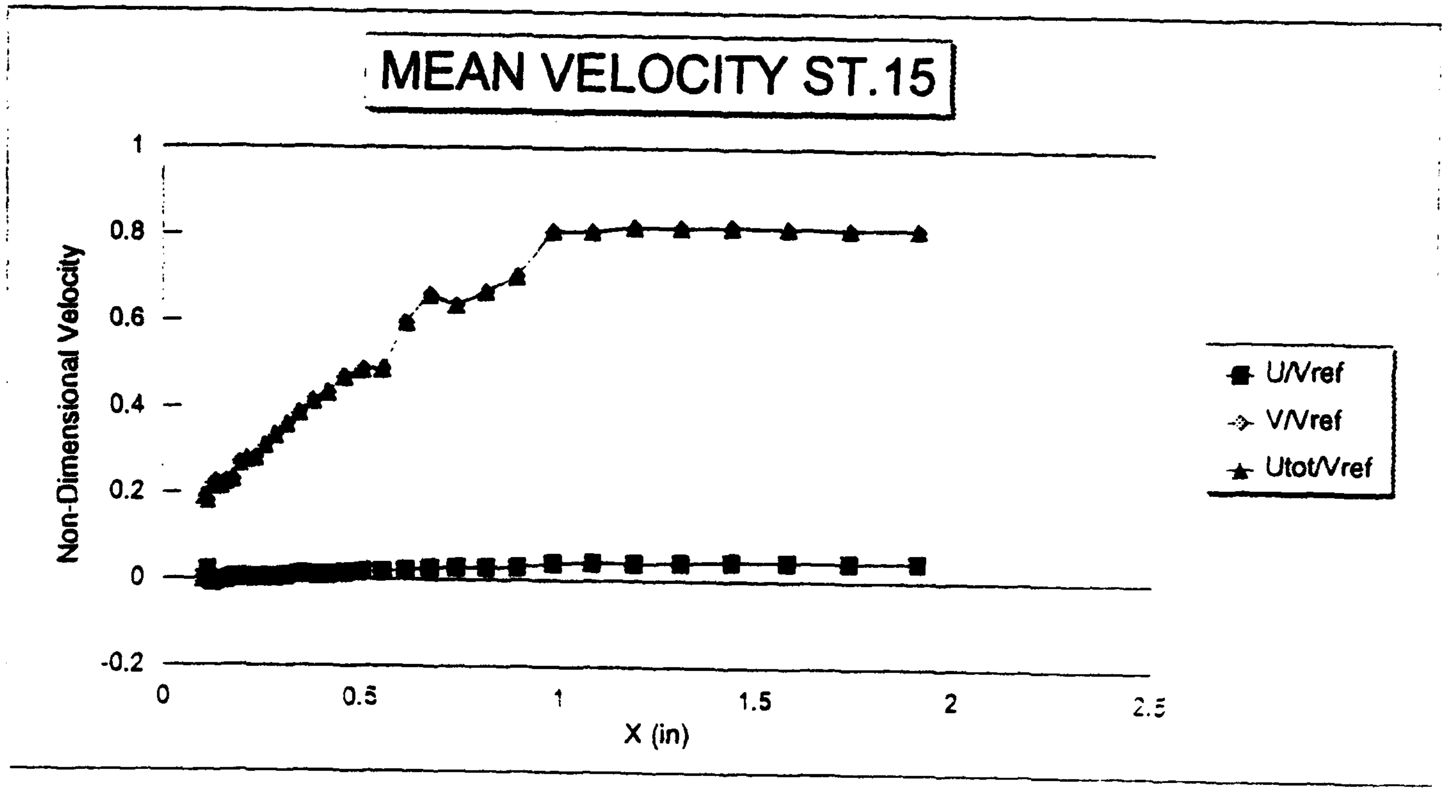


Figure 31. Survey at Station 15

It can be seen in Appendix B that for each station all the histograms to the left of the discontinuity had negative and positive velocities and the histograms to the right of the discontinuity had only positive velocities.

D. WAKE SURVEYS (STATIONS 16 THROUGH 19)

Figure 32 through 34 show the horizontal (U) and vertical (V) velocity components and the total velocity (Utot) distributions through the wakes at the exit of the cascade. Like the other surveys, each point in these plots represents a histogram of 3000 data points which where analyzed at plus and minus two standard deviations. The ones that delimited positive from negative velocities for each station are printed in Appendix C. Two features are evident in these plots; firstly, the width of the wake increased from station 16 to 19, and secondly, the region of intermittent reverse flow was within the wake on the suction side of the blade (to the left of the X=0 line for blade 6).

E. SUMMARY

Once all the histograms from each station were analyzed, the boundary of the region of intermittent reverse flow (last point of negative velocity at a station) was plotted for each station 2 through 19. This is shown in figure 36 with dotted lines. Also shown on this plot , with the solid line, is the region of reverse flow as determined by a negative mean velocity on the vertical component. This line represented the reverse flow region of the leading edge separation bubble which had been observed with flow visualization techniques. It was postulated that the reason reverse flow was measured in this region was because the flow was unsteady and seed particles were entrained into the leading edge separation bubble. This was not possible at lower inlet air angles because the flow was relatively steady compared to the present study. Flow visualization also confirmed the two distinct regions of intermittent reverse flow, as shown by the two regions of dotted lines; the lower region being associated with the leading edge separation bubble and the upper region representing the turbulent separation that occurred aft of mid chord.

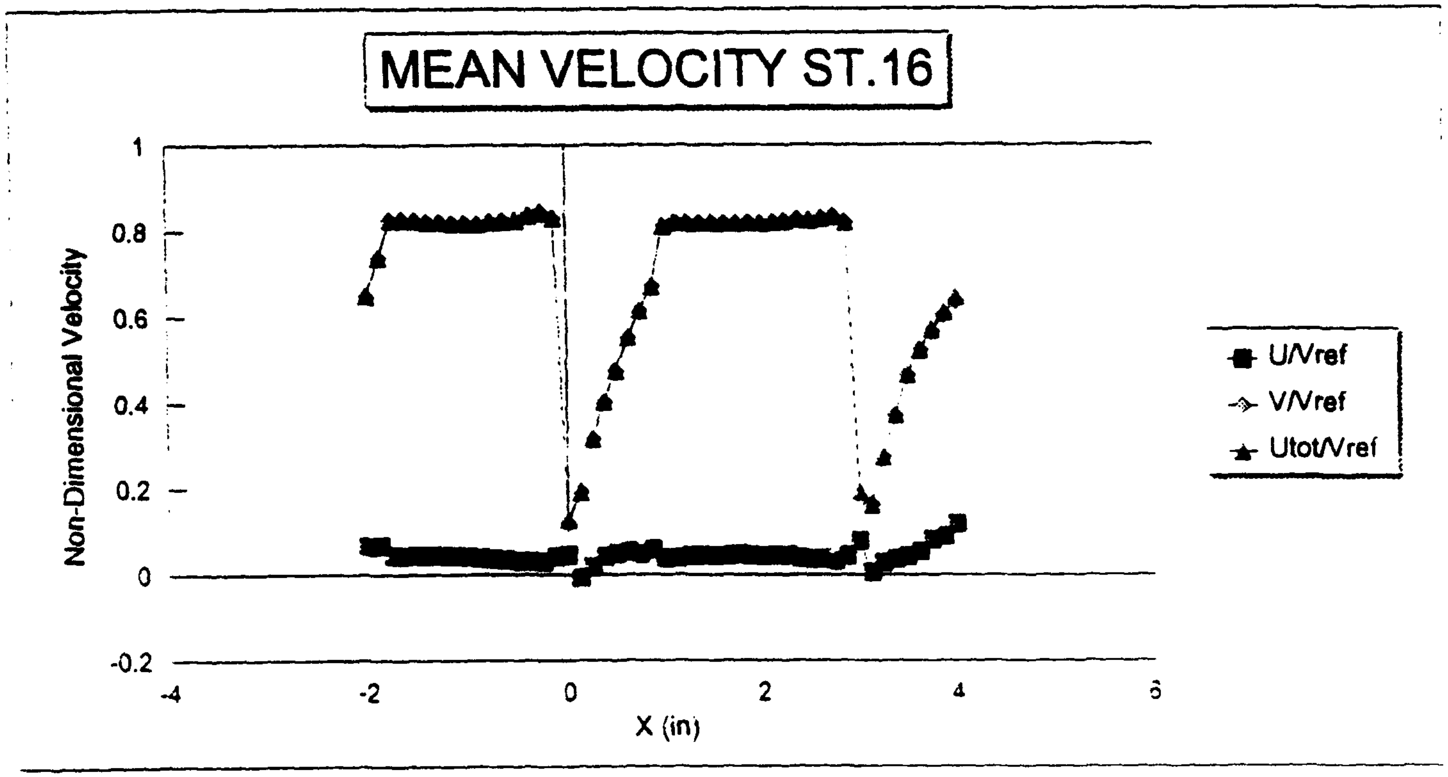


Figure 32. Survey at Station 16

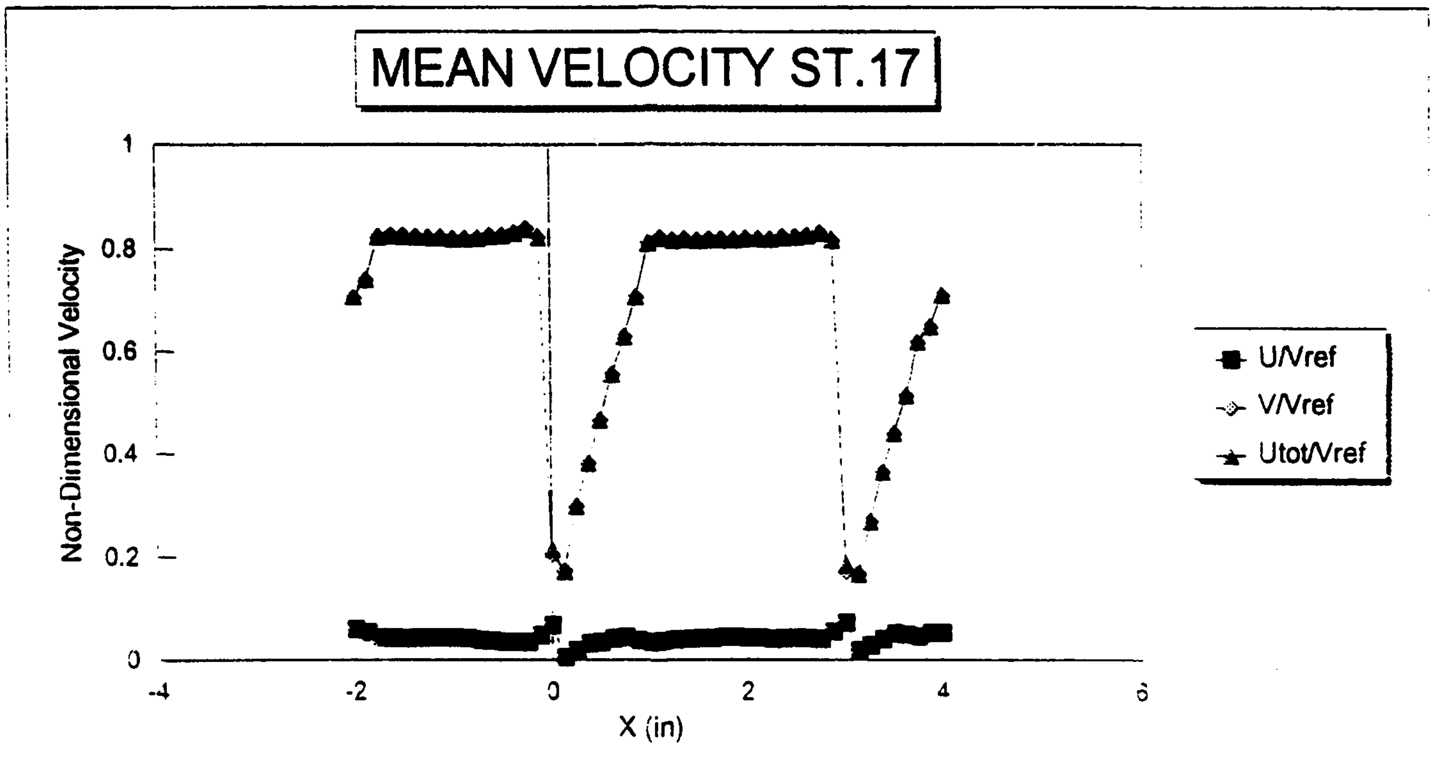


Figure 33. Survey at Station 17

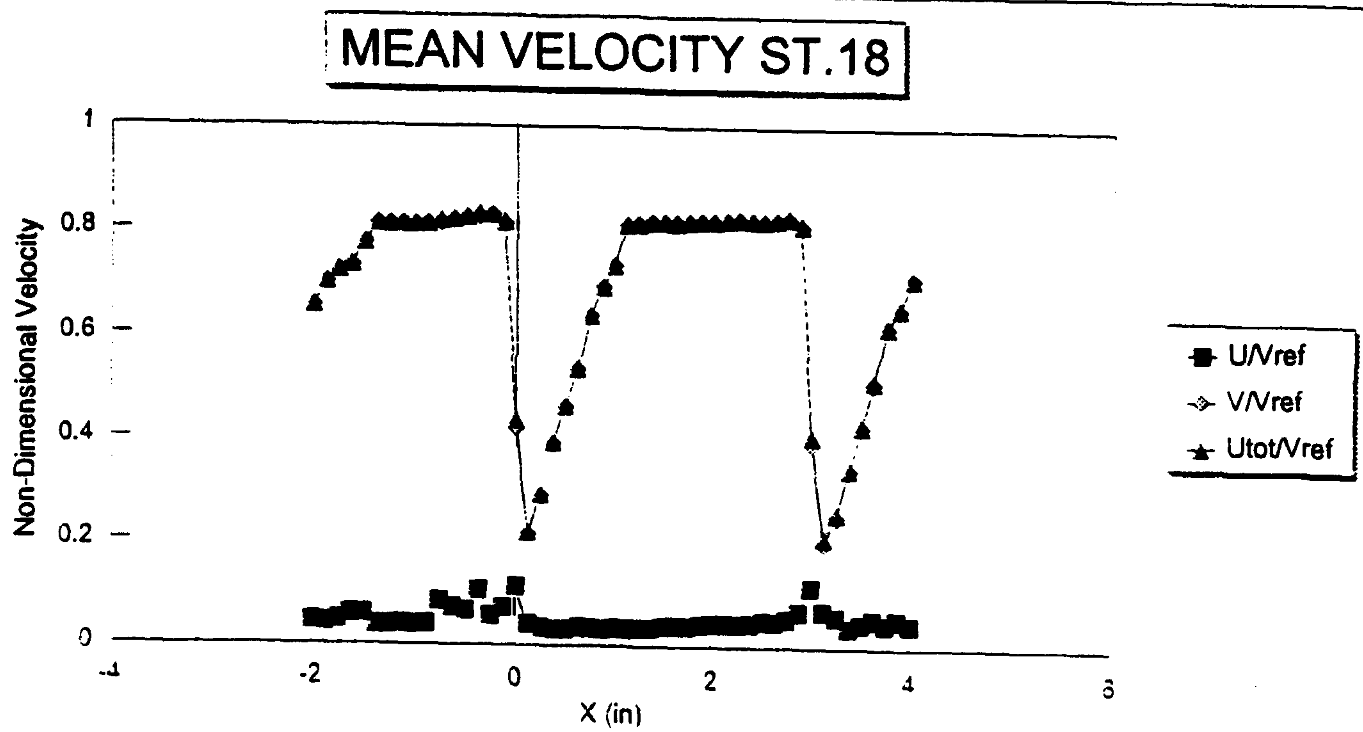


Figure 34. Survey at Station 18

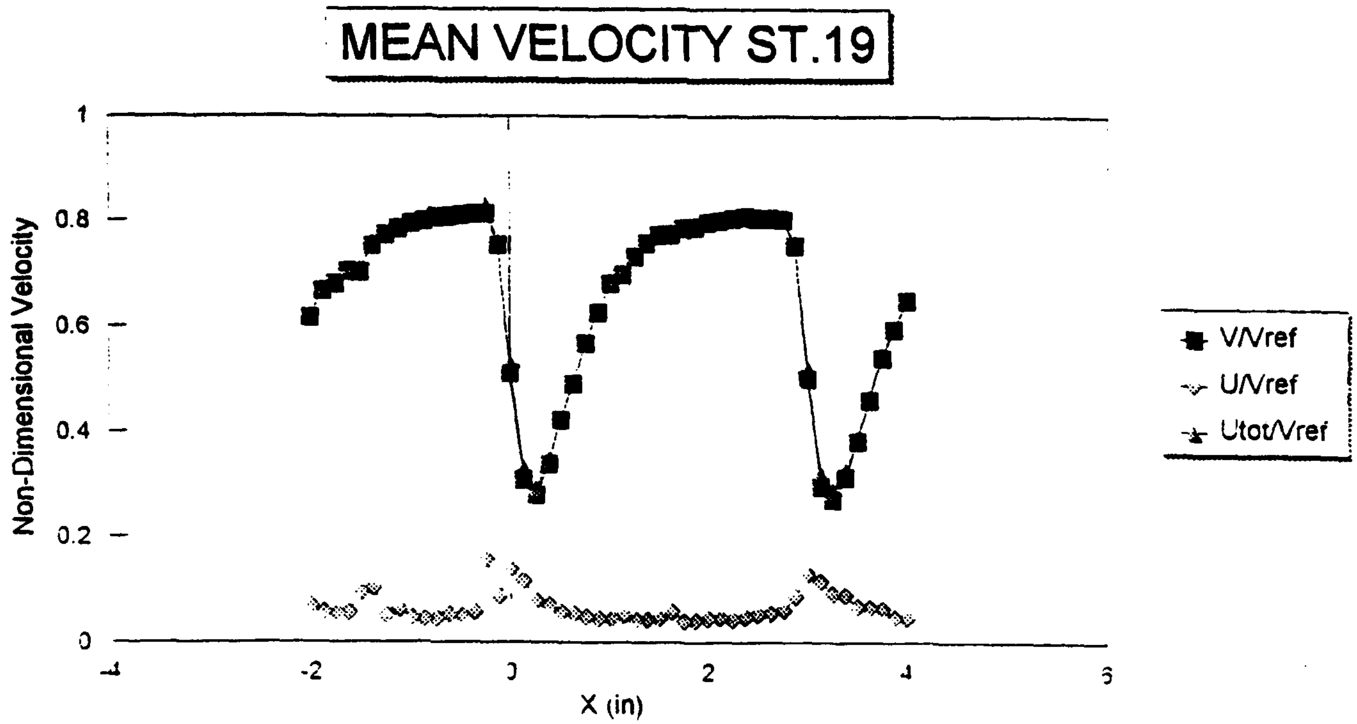


Figure 35. Survey at Station 19

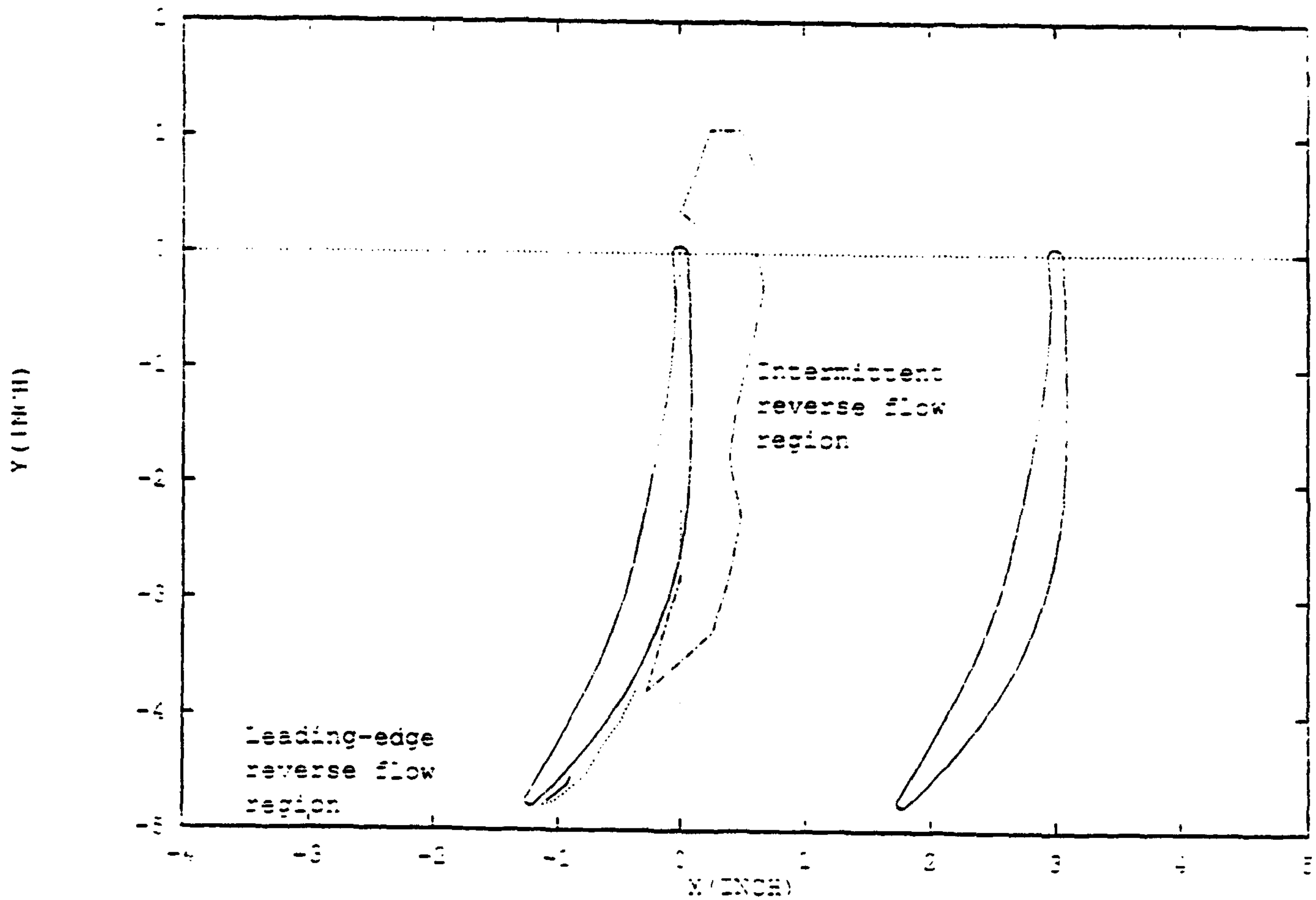


Figure 36. Reverse Flow Regions

More detailed surveys are needed between stations 6 and 7 to fully characterize the transition between these two regions.

V. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The lack of experimental data of compressor cascades at or near stall has been somewhat alleviated with the current set of detailed measurements. The following specific conclusions can be drawn.

1. The controlled diffusion (CD) cascade was successfully stalled. This was confirmed with the blade surface pressure measurements, which showed that for 50 degrees the normal force on the blade had decreased. Flow visualization techniques (both tufting and laser sheet with fog or smoke) also confirmed that the blades had stalled.
2. It was possible to measure both mean reverse flow and intermittent reverse flow with the LDV. With the appropriate use of frequency shifting it was possible to do these measurements with the certainty that the results from the histograms were correctly representing negative or positive velocities.
3. The regions of reverse flow were plotted. With the information obtained from each histogram at each station it was possible to plot regions of intermittent reverse flow and also a region of leading-edge reverse flow.
4. It was possible to take LDV measurements inside the reverse flow region during the stalling process, which was unsteady.
5. The inlet-flow pitchwise surveys at an inlet air angle of 48 degrees compared very well with previous measurements.

B. RECOMMENDATIONS

The following specific recommendations for further measurements at the 50 degrees inlet-air angle setting are proposed;

1. More detailed measurements should be taken in the leading edge separation bubble region (station 2 to 4).
2. More detailed measurements should be taken between stations 6 and 8 to further characterize the region of forward and intermittent reverse flow.
3. Detailed measurements are needed between stations 15 and 16 to determine the trailing edge base flow region.
4. Pressure side passage surveys are also needed.
5. Measurements away from mid span are needed to determine the degree of two dimensionality of the flow.

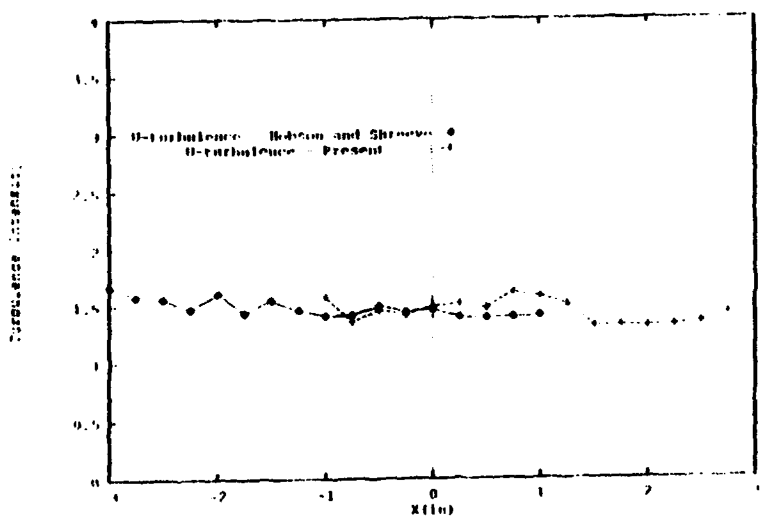
Blade surface pressure measurements at approximately 49 degrees inlet air angle are also needed to determine the maximum blade loading condition.

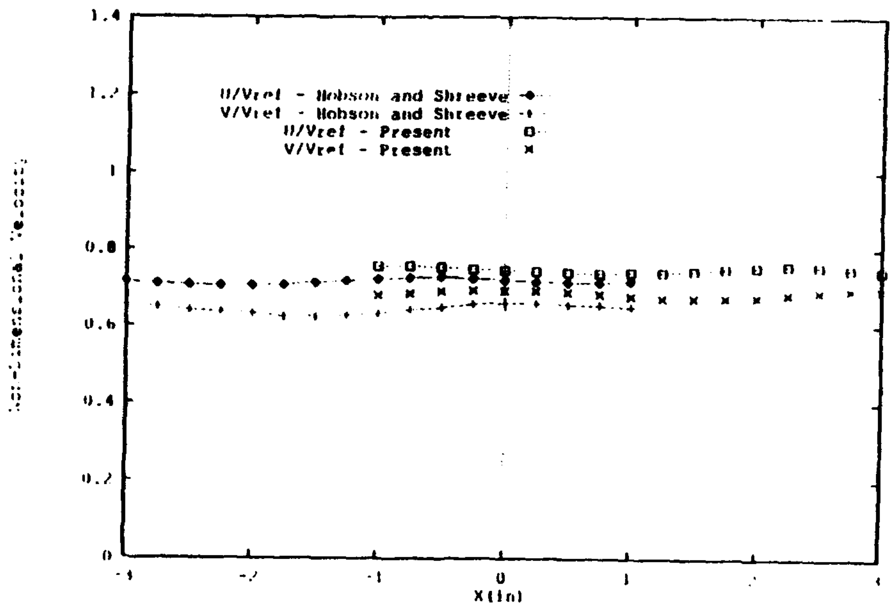
VI APPENDICES

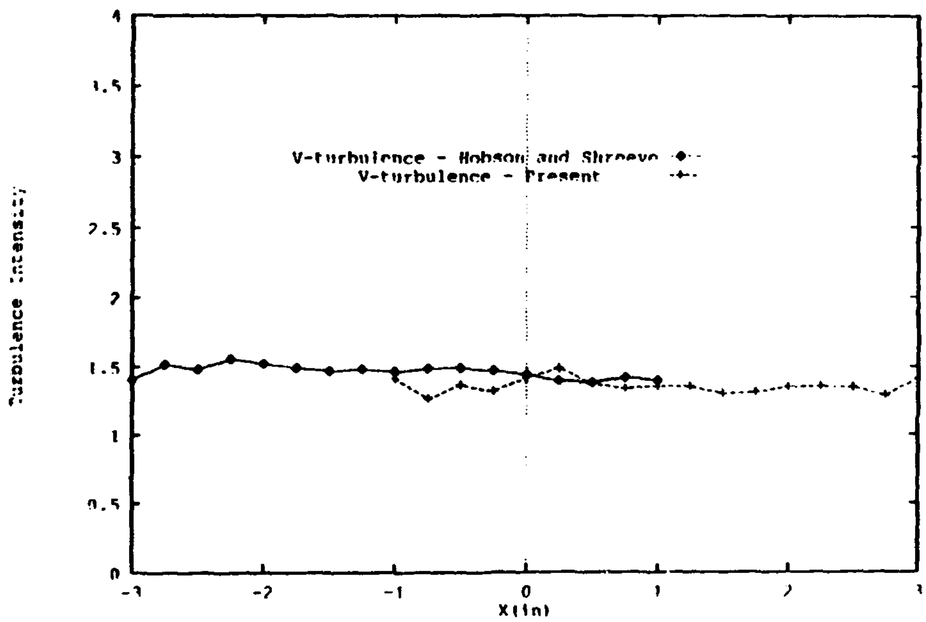
A. INLET SURVEYS AT 48 DEGREES (STATIONS 1 THROUGH 1E)

Pitchwise survey at station 1

X(i)	Y(i)	U/Vref	V/Vref	U-turb refer	V-turb refer	Reynolds Stress	Correl. Coeff.
3	-6.292	0.74138	0.692654	1.463915	1.413083	0.067128	0.046882
2.75	-6.292	0.746466	0.692364	1.416979	1.283615	0.085471	0.06789
2.4999	-6.292	0.753923	0.688168	1.334609	1.346387	0.042565	0.034223
2.2499	-6.292	0.756578	0.682245	1.311649	1.348866	0.05643	0.04608
2	-6.292	0.753071	0.674006	1.300756	1.348572	0.017453	0.014374
1.75	-6.292	0.748567	0.67201	1.31101	1.306448	0.059379	0.050087
1.5	-6.292	0.742543	0.671287	1.303482	1.298236	0.043573	0.0372
1.25	-6.292	0.738081	0.670637	1.501345	1.348765	0.127392	0.090889
1	-6.292	0.738915	0.676326	1.574865	1.353234	0.120067	0.081395
0.75	-6.2921	0.735438	0.680991	1.61169	1.334633	0.115111	0.077315
0.4999	-6.292	0.738607	0.687099	1.475767	1.369417	0.11728	0.083842
0.25	-6.292	0.741475	0.690215	1.509785	1.488283	0.056298	0.036198
-0.0001	-6.292	0.744766	0.690738	1.487172	1.414451	0.093394	0.064144
-0.2501	-6.292	0.746923	0.691276	1.409122	1.312934	0.002955	0.002307
-0.5001	-6.292	0.751832	0.688292	1.455245	1.362432	0.12184	0.088783
-0.75	-6.292	0.754739	0.683108	1.350538	1.25881	0.110055	0.093525
-1	-6.292	0.755145	0.678992	1.576743	1.411971	0.074725	0.048492

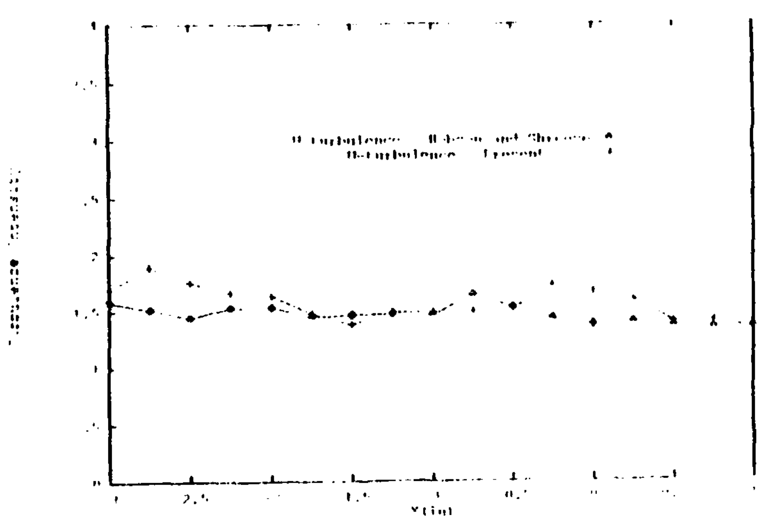


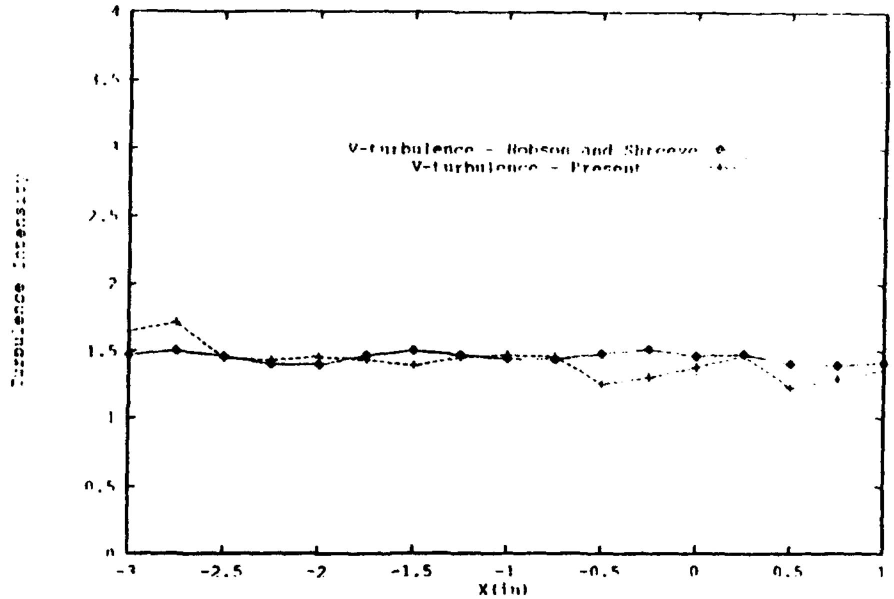

U/Vref - Hobson and Shreeve
V/Vref - Hobson and Shreeve
U/Vref - Present
V/Vref - Present
X(in)

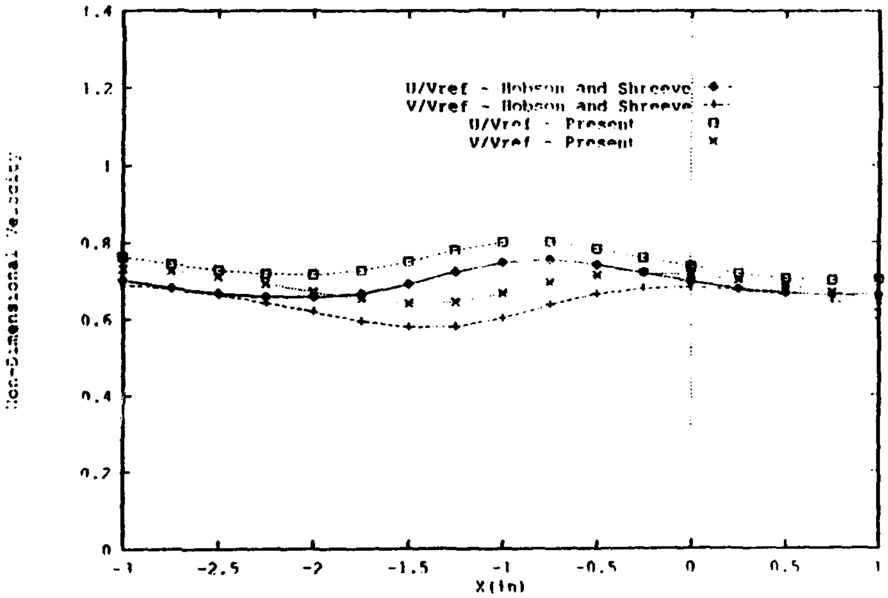

V-turbulence - Hobson and Shreeve
V-turbulence - Present
Turbulence Intensity
X(in)

Pitchwise survey at station 1a

X(i)	Y(i)	U/Vref	V/Vref	U-turb refer	V-turb refer	Reynolds Stress	Correl. Coeff.
1	-5.5	0.703738	0.644747	1.320592	1.353239	0.112141	0.092111
0.75	-5.5	0.700153	0.668084	1.394284	1.284097	0.127712	0.104707
0.5	-5.5	0.705206	0.687196	1.384214	1.217664	0.033909	0.029531
0.25	-5.5	0.718	0.702983	1.589035	1.464419	0.166871	0.105262
0	-5.5001	0.736945	0.71407	1.665003	1.373785	0.190951	0.122541
-0.2501	-5.5	0.758807	0.718859	1.72404	1.296312	-0.06843	-0.04495
-0.5	-5.5	0.782435	0.712994	1.508213	1.245929	0.064386	0.050296
-0.75	-5.5001	0.799708	0.693006	1.487321	1.454848	-0.00563	-0.00382
-1	-5.5	0.800899	0.666727	1.479869	1.467399	-0.00566	-0.00383
-1.25	-5.5	0.779457	0.642881	1.482129	1.449028	-0.00456	-0.00311
-1.5	-5.5	0.749275	0.638938	1.373295	1.386049	0.071845	0.055405
-1.7501	-5.5	0.726591	0.651752	1.472721	1.426907	0.126707	0.088507
-2	-5.5	0.716153	0.670346	1.632892	1.457935	0.164624	0.101506
-2.25	-5.5	0.718584	0.692819	1.663465	1.428475	0.146736	0.090645
-2.5001	-5.5	0.728194	0.711438	1.754875	1.446504	0.188347	0.108915
-2.7501	-5.5	0.744533	0.725975	1.892023	1.714723	0.139615	0.063169
-3	-5.5	0.763451	0.732077	1.694677	1.649282	0.01088	0.005714

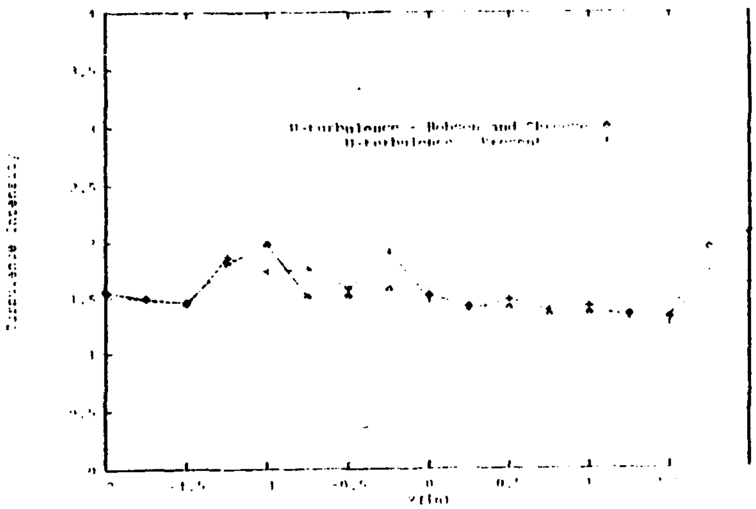


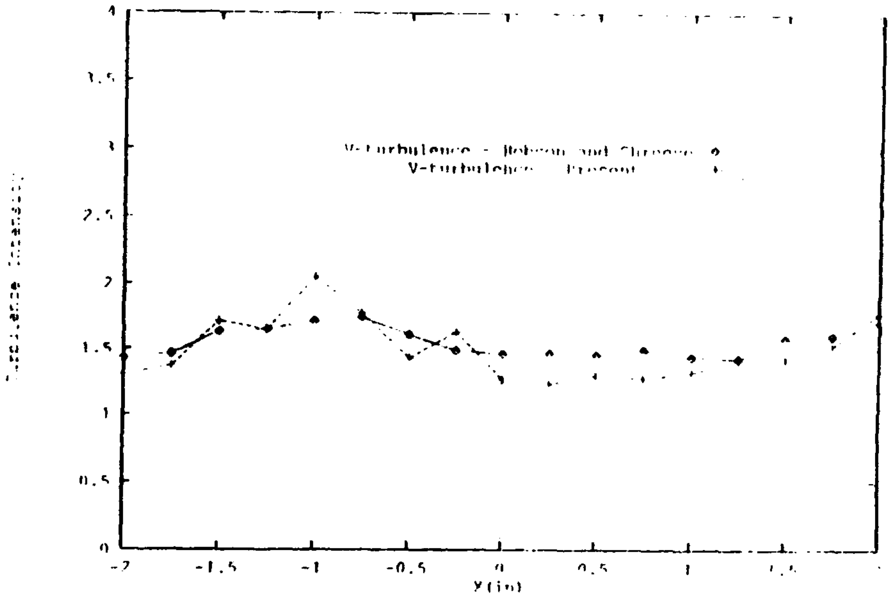

V-turbulence - Hobson and Shreeve
V-turbulence - Present
X(in)

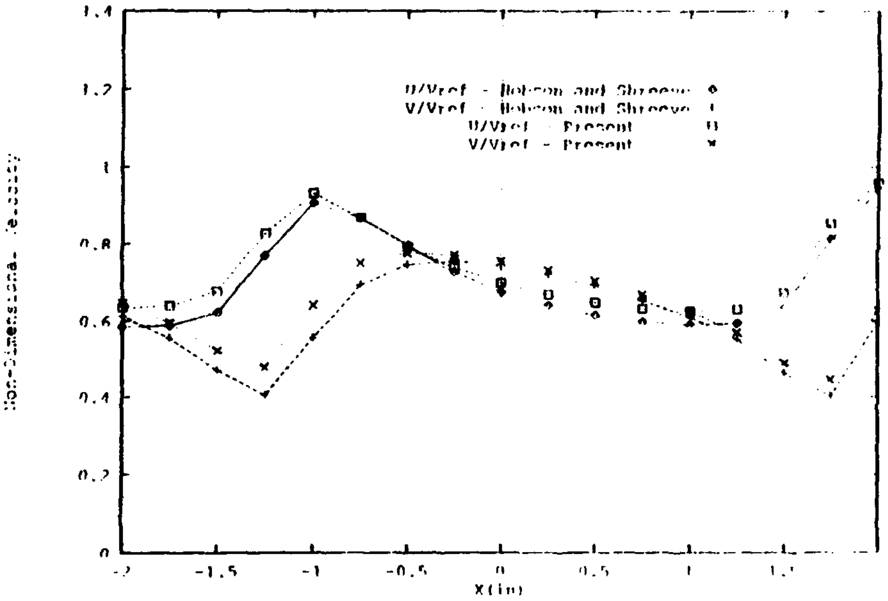

U/Vref - Hobson and Shreeve
V/Vref - Hobson and Shreeve
U/Vref - Present
V/Vref - Present
X(in)

Pitchwise survey at station 1b

X(i)	Y(i)	U/Vref	V/Vref	U-turb refer	V-turb refer	Reynolds Stress	Correl. Coeff.
2	-5	0.958084	0.627842	1.607578	1.781224	0.096447	0.049347
1.75	-5	0.853672	0.444457	1.729976	1.526591	0.025728	0.014273
1.5	-5	0.673285	0.487715	1.244763	1.41887	0.117505	0.097474
1.25	-5	0.63042	0.569016	1.298135	1.408513	0.060343	0.048351
1	-5	0.624632	0.626094	1.413872	1.319718	0.113958	0.089479
0.75	-5	0.632516	0.669163	1.375078	1.271422	0.162005	0.135761
0.4999	-5.0001	0.647871	0.703524	1.474691	1.29333	0.197921	0.152035
0.25	-5	0.668768	0.730604	1.378618	1.227758	0.152697	0.132172
0	-5	0.699079	0.755237	1.472813	1.265611	0.154464	0.121407
-0.2501	-5	0.738667	0.770627	1.907636	1.633206	-0.02761	-0.01298
-0.5	-5	0.791511	0.77656	1.580932	1.429406	0.100471	0.065138
-0.75	-5	0.866611	0.750163	1.757226	1.776589	-0.29205	-0.13706
-1	-5	0.931505	0.641569	1.729945	2.052353	0.062178	0.025658
-1.25	-5	0.827388	0.477815	1.866588	1.647463	0.104234	0.04966
-1.5	-5	0.677658	0.521568	1.426295	1.718446	0.149499	0.089363
-1.75	-5	0.640081	0.594843	1.475752	1.367188	0.244467	0.177518
-2	-5	0.63561	0.646967	1.527771	1.302694	0.204851	0.1508

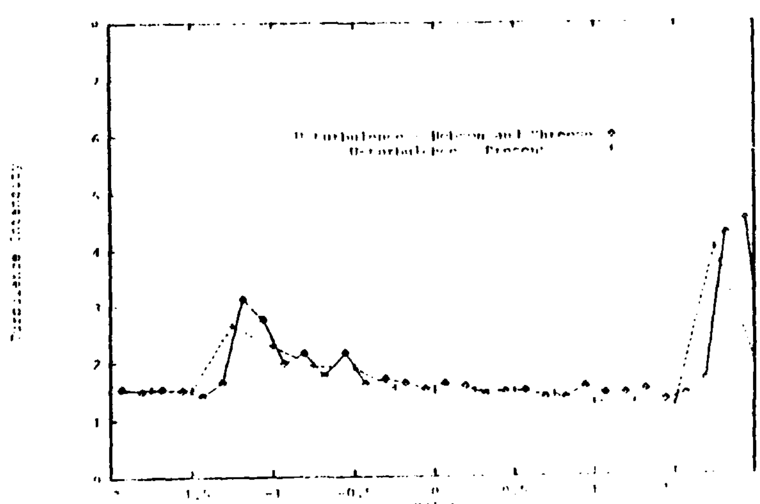


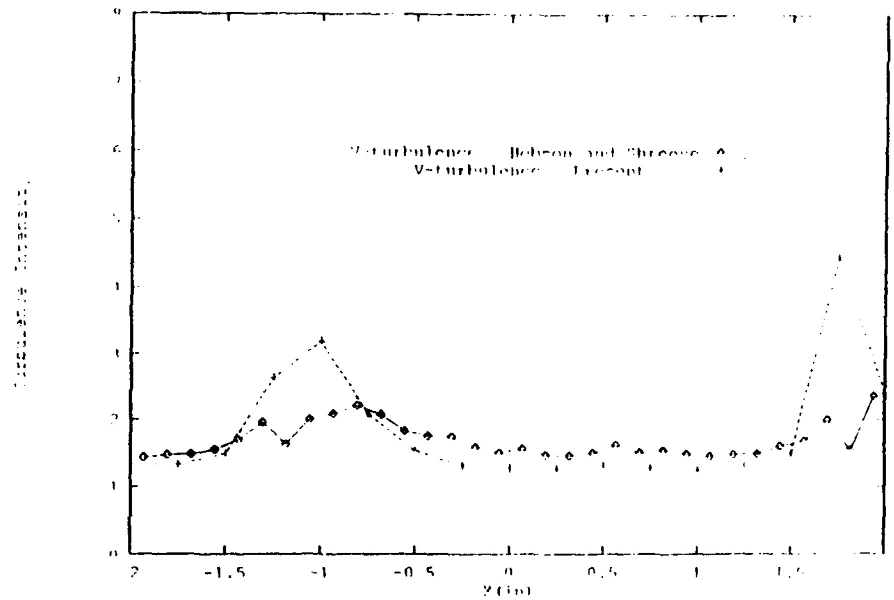

V-turbulence - Hobson and Shreeve
V-turbulence - Present
X(in)


U/Vref - Hobson and Shreeve
V/Vref - Hobson and Shreeve
U/Vref - Present
V/Vref - Present
X(in)

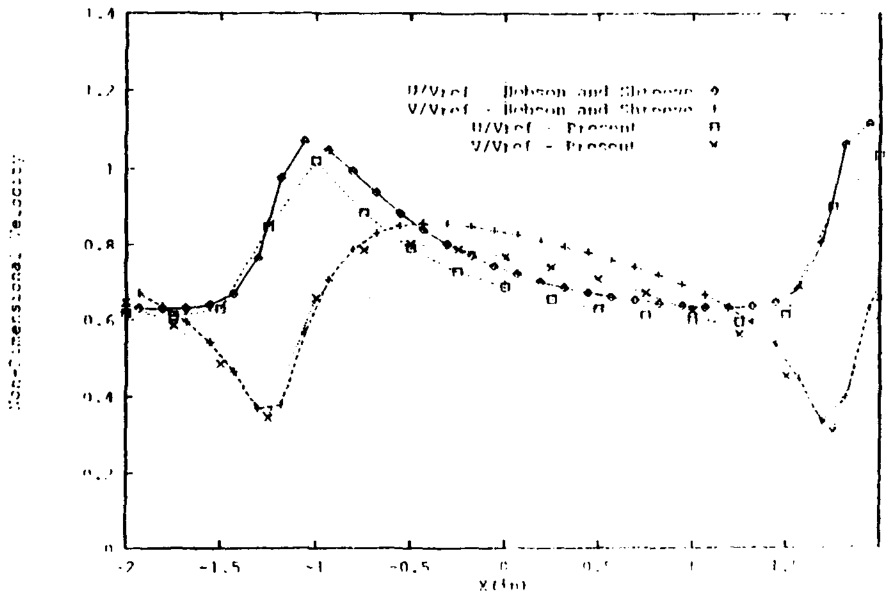
Pitchwise survey at station 1c

X(i)	Y(i)	U/Vref	V/Vref	U-turb refer	V-turb refer	Reynolds Stress	Correl. Coeff.
2	-4.896	1.032942	0.655777	1.95444	2.395522	0.309529	0.09653
1.75	-4.896	0.899393	0.305473	4.000105	4.453251	-3.537	-0.28991
1.5	-4.896	0.611193	0.452963	1.218652	1.492263	0.128289	0.103002
1.25	-4.896	0.592662	0.560462	1.266566	1.320667	0.138072	0.120522
1	-4.896	0.596724	0.621573	1.264895	1.247186	0.166161	0.15379
0.75	-4.896	0.609269	0.668145	1.407681	1.275609	0.15649	0.127247
0.4999	-4.896	0.626958	0.705764	1.471754	1.314726	0.242738	0.183168
0.25	-4.896	0.65313	0.738446	1.490103	1.267063	0.210081	0.162463
0	-4.896	0.685123	0.765836	1.481566	1.287087	0.121722	0.093201
-0.25	-4.896	0.726156	0.787	1.542182	1.306153	0.117827	0.085408
-0.5	-4.896	0.78884	0.799841	1.883499	1.530384	-0.03132	-0.01587
-0.75	-4.896	0.884321	0.784678	1.922391	2.078085	-0.77927	-0.28482
-1	-4.896	1.019106	0.655669	2.272077	3.191467	-0.67551	-0.13602
-1.25	-4.896	0.846569	0.34376	2.641355	2.621281	-0.66567	-0.14038
-1.5	-4.896	0.627775	0.48539	1.513604	1.485803	0.192735	0.125133
-1.75	-4.896	0.609753	0.585436	1.529772	1.327857	0.26045	0.18721
-2	-4.896	0.616697	0.645592	1.495324	1.342328	0.165122	0.120114





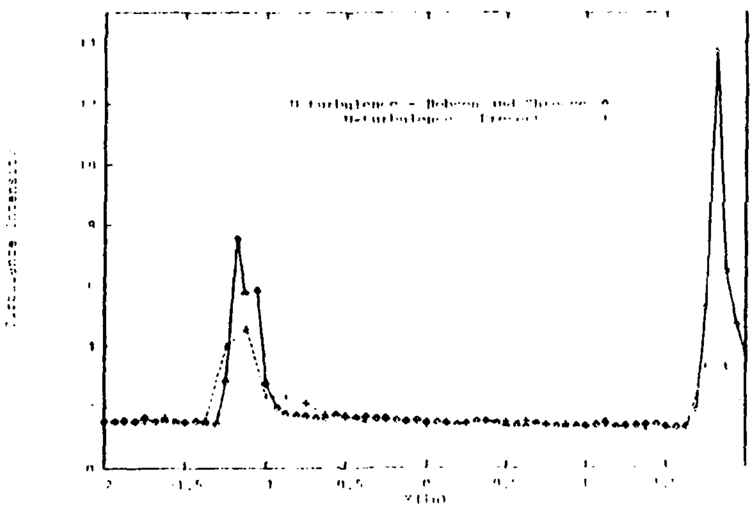
X(in)

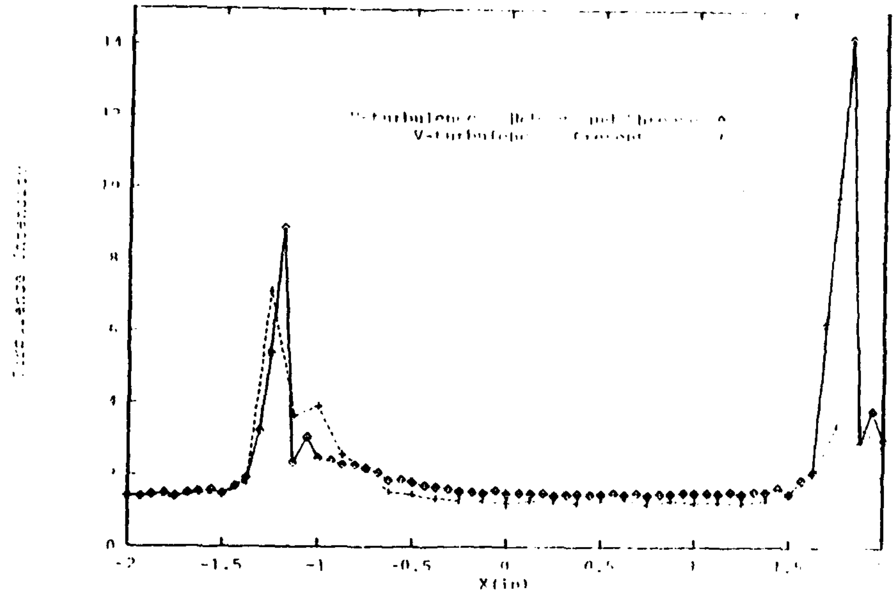


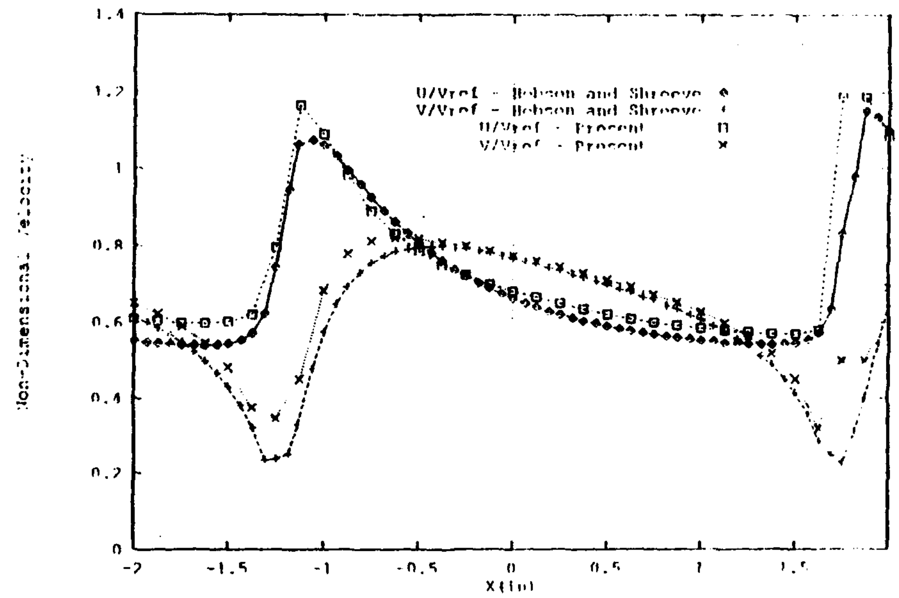
U/Vref - Hobson and Shreeve
V/Vref - Hobson and Shreeve
U/Vref - Present
V/Vref - Present
X(in)

Pitchwise survey at station 1d

X(i)	Y(i)	U/Vref	V/Vref	U-turb refer	V-turb refer	Reynolds Stress	Correl. Coeff.
2	-4.844	1.07927	0.691071	1.70938	2.788001	0.175375	0.05373
1.875	-4.844	1.187167	0.497841	3.30138	3.384047	1.44019	0.188222
1.75	-4.844	1.187167	0.497841	3.30138	3.384047	1.44019	0.188222
1.625	-4.844	0.577508	0.318685	1.266654	1.977669	0.232642	0.135599
1.5	-4.844	0.568449	0.450118	1.300276	1.457942	0.132569	0.102105
1.375	-4.8441	0.569421	0.518367	1.247914	1.316408	0.125447	0.111498
1.25	-4.844	0.573569	0.563031	1.317631	1.238009	0.167099	0.149569
1.125	-4.844	0.577805	0.598154	1.354335	1.259156	0.17762	0.152079
1	-4.8441	0.58466	0.626691	1.316982	1.238104	0.177691	0.159115
0.875	-4.8441	0.591886	0.651528	1.421663	1.298462	0.20271	0.160336
0.75	-4.844	0.599771	0.672473	1.411686	1.197735	0.148799	0.128494
0.625	-4.844	0.609006	0.693352	1.542253	1.321696	0.154754	0.110851
0.5	-4.844	0.62082	0.711766	1.534475	1.310233	0.184049	0.133661
0.375	-4.844	0.63455	0.728728	1.519501	1.234516	0.170355	0.132599
0.2499	-4.844	0.649186	0.74463	1.482682	1.261745	0.127431	0.099457
0.125	-4.8441	0.66519	0.75998	1.454505	1.277603	0.122416	0.096185
0.0001	-4.844	0.680877	0.77378	1.423782	1.221272	0.16884	0.141775
-0.125	-4.844	0.699117	0.786315	1.466321	1.288817	0.18499	0.142925
-0.2501	-4.844	0.723446	0.799266	1.550707	1.289112	0.11641	0.085026
-0.3751	-4.844	0.748298	0.807987	1.524747	1.349774	0.108343	0.076864
-0.5	-4.844	0.78575	0.817583	1.755867	1.459877	0.037677	0.021461
-0.625	-4.844	0.829675	0.820534	1.750142	1.541152	0.114339	0.061895
-0.7501	-4.844	0.888058	0.812054	2.131969	2.158399	-0.63247	-0.20068
-0.875	-4.844	0.980107	0.778259	2.326029	2.584084	-1.17601	-0.28567
-1	-4.844	1.087523	0.683	2.355792	3.890212	-0.99661	-0.15878
-1.125	-4.844	1.164313	0.45077	4.517489	3.635272	2.47677	0.220208
-1.25	-4.844	0.795877	0.345364	3.956939	7.094027	-4.37986	-0.22782
-1.375	-4.844	0.619863	0.373951	1.557443	1.789111	0.141239	0.074009
-1.5	-4.844	0.601546	0.482327	1.528185	1.44206	0.223027	0.147768
-1.625	-4.844	0.597837	0.545238	1.65922	1.501836	0.200149	0.117276
-1.75	-4.844	0.598954	0.589662	1.510196	1.374525	0.216697	0.152423
-1.875	-4.844	0.60419	0.623358	1.480675	1.420208	0.258699	0.179625
-2	-4.844	0.608207	0.649622	1.460579	1.435412	0.235375	0.163923

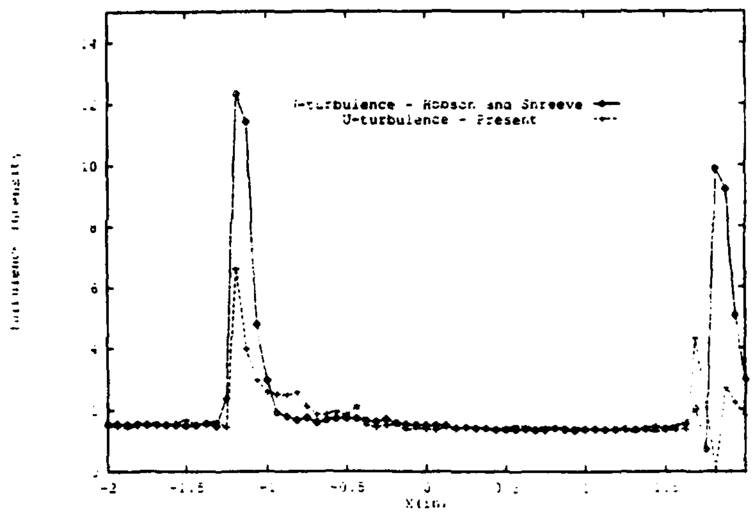


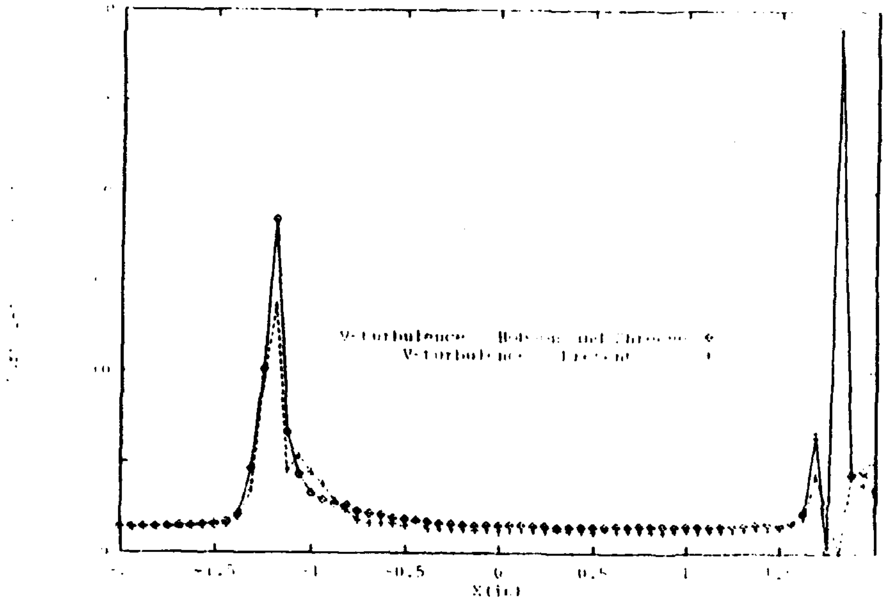

X(in)

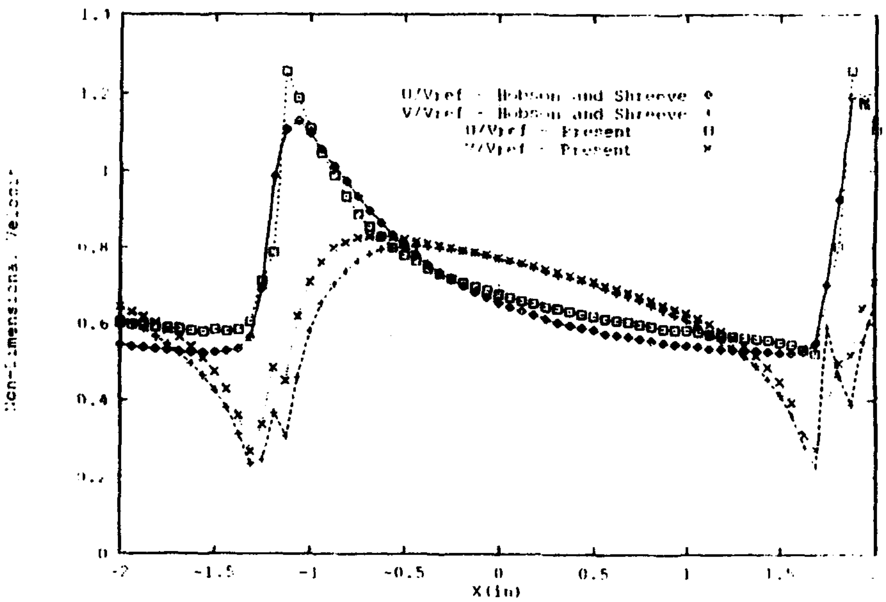

U/Vref - Hobson and Shreeve
V/Vref - Hobson and Shreeve
U/Vref - Present
V/Vref - Present
Non-Dimensional Velocity
X(in)

Pitchwise survey at station 1e

X(I)	Y(I)	U/Vref	V/Vref	U-turb rofer	V-turb refer	Reynolds Stress	Correl. Coeff.
2	-4.0179	1.104954	0.710223	1.032042	3.331014	0.096095	0.023890
1.9375	-4.0178	1.172704	0.640601	2.342492	3.025201	1.21891	0.200693
1.875	-4.016	1.256606	0.516292	2.693777	4.303798	0.708296	0.090920
1.8125	-4.018	0.00174	0.496959	0	0	1.4E-13	0
1.8125	-4.018	0.00174	0.496959	0	0	1.4E-13	0
1.6875	-4.018	0.521087	0.271451	4.320120	4.369026	3.77632	0.291032
1.625	-4.0179	0.531798	0.311281	1.37964	1.924063	0.163447	0.089796
1.5625	-4.0179	0.549976	0.39383	1.343097	1.600143	0.121093	0.082505
1.5	-4.0179	0.551968	0.449328	1.336313	1.453131	0.179578	0.13153
1.4375	-4.0179	0.557105	0.483486	1.293476	1.34917	0.141146	0.127196
1.375	-4.0179	0.560493	0.516940	1.335278	1.320077	0.161049	0.13201
1.3125	-4.0279	[illegible]	0.542287	1.300314	1.278143	0.175647	0.182791
1.25	-4.0179	0.566993	0.564181	1.330109	1.26081	0.170191	0.149136
1.1875	-4.0179	0.569424	0.581733	1.380195	1.227346	0.154558	0.137816
1.125	-4.0179	0.573005	0.599761	1.336045	[illegible]	0.159913	0.139707
1.0625	-4.0179	0.578280	0.614066	1.35327	[illegible]	0.152095	0.135365
1	-4.0179	0.582914	0.627305	1.367807	1.294576	0.116726	0.095930
0.9375	-4.0179	0.584041	0.630723	1.419107	1.239193	0.150060	0.125141
0.875	-4.0179	0.587639	0.649597	1.374946	1.190633	0.156786	0.13931
0.8125	-4.0179	0.593906	0.661456	1.416231	1.194316	0.167741	0.144584
0.75	-4.0179	0.597651	0.671044	1.433031	1.200284	0.152073	0.120093
0.6874	-4.0179	0.604635	0.683167	1.385216	1.201004	0.154444	0.139044
0.625	-4.0179	0.608319	0.692693	1.454447	1.201799	0.164774	0.13712
0.5625	-4.0179	0.612074	0.700364	1.494042	1.204616	0.126956	0.094743
0.5	-4.0179	0.619323	0.711443	1.410006	1.101329	0.117676	0.102191
0.4375	-4.0179	0.624996	0.716251	1.391453	1.244913	0.098860	0.083048
0.3749	-4.0179	0.632414	0.727987	1.395605	1.207425	0.115061	0.099321
0.3125	-4.0179	0.640038	0.737398	1.455222	1.207105	0.20375	0.190223
0.25	-4.0179	0.644703	0.743782	1.452194	1.232000	0.150749	0.122009
0.1875	-4.0179	0.653396	0.751964	1.357687	1.214006	0.107546	0.094904
0.125	-4.0179	0.660764	0.760571	1.438245	1.246210	0.151062	0.12205
0.0624	-4.0179	0.66937	0.76640	1.344009	1.254672	0.101196	0.087230
0.0002	-4.0179	0.676092	0.773773	1.390797	1.227604	0.151091	0.129405
-0.0625	-4.0179	0.687439	0.780576	1.411746	1.266899	0.141673	0.11522
-0.125	-4.0179	0.696710	0.78655	1.35775	1.261007	0.104694	0.089099
-0.1875	-4.0179	0.706957	0.791701	1.557207	1.305365	0.196323	0.140406
-0.2501	-4.0179	0.710394	0.799186	1.495374	1.320303	0.132904	0.097331
-0.3125	-4.0179	0.730300	0.805671	1.440917	1.33043	0.147229	0.111417
-0.3751	-4.0179	0.744304	0.811289	1.507445	1.353986	0.149898	0.106012
-0.4374	-4.0179	0.764471	0.815535	2.130511	1.050914	-0.12367	-0.04562
-0.4999	-4.0179	0.779957	0.821600	1.010136	1.499122	0.167725	0.089461
-0.5625	-4.0179	0.799114	0.826303	1.990515	1.641839	0.100205	0.045329
-0.625	-4.0179	0.827730	0.827286	1.062091	1.626697	-0.04393	-0.02100
-0.6875	-4.0179	0.854165	0.820276	1.660257	1.635730	-0.15403	-0.07363
-0.75	-4.0179	0.88603	0.82512	2.127109	1.814143	-0.44346	-0.16716
-0.8125	-4.0179	0.933124	0.813201	2.570361	2.427983	-1.23673	-0.38736
-0.875	-4.0179	0.987152	0.790239	2.409343	2.897377	-1.92336	-0.39395
-0.9375	-4.0179	1.044209	0.761938	2.921270	3.821029	-2.09780	-0.3179
-1	-4.0179	1.11106	0.709721	2.873471	4.443779	-1.02409	-0.23212
-1.0625	-4.0179	1.180614	0.610798	2.963309	5.316100	0.707767	0.065391
-1.125	-4.0179	1.2550	0.449987	3.976251	4.566784	3.42437	0.194209
-1.1875	-4.0179	0.707390	0.404963	6.602090	13.90906	-61.601	-1
-1.25	-4.0179	0.711973	0.330919	2.449706	8.507378	3.30740	0.346142
-1.3125	-4.0179	0.684034	0.269192	1.632773	3.460178	0.692621	0.160025
-1.375	-4.0179	0.585313	0.360433	1.879285	1.906326	0.299146	0.144535
-1.4375	-4.0179	0.58061	0.420386	1.907363	1.525230	0.239777	0.181703
-1.5	-4.0179	0.589323	0.474761	1.687465	1.697433	0.103141	0.052377
-1.5625	-4.0179	0.580535	0.510003	1.567966	1.512884	0.200282	0.133013
-1.6251	-4.0179	0.582999	0.541463	1.569262	1.466995	0.109005	0.119474
-1.6875	-4.0179	0.587700	0.566107	1.482344	1.34324	0.210105	0.153061
-1.75	-4.0179	0.589372	0.584430	1.49727	1.441306	0.157667	0.10620
-1.8125	-4.0176	0.592292	0.602634	1.821894	1.492893	0.242462	0.156317
-1.875	-4.0179	0.595893	0.618857	1.437712	1.396964	0.170729	0.123649
-1.9375	-4.0175	0.598204	0.6333	1.495904	1.371635	0.180075	0.127692
-2	-4.0179	0.601397	0.645799	1.499932	1.483252	0.193697	0.126979

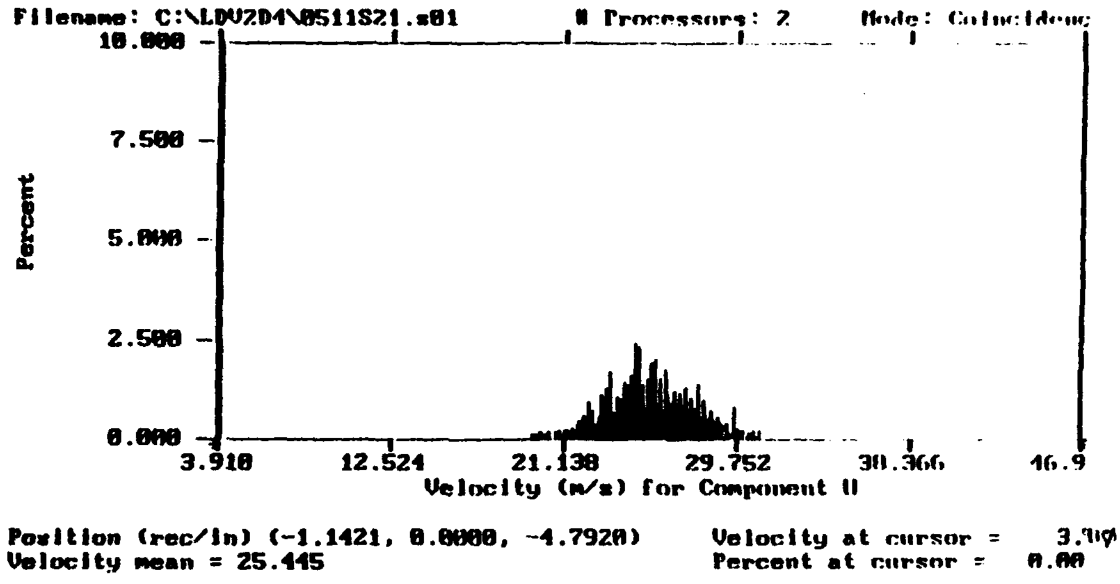


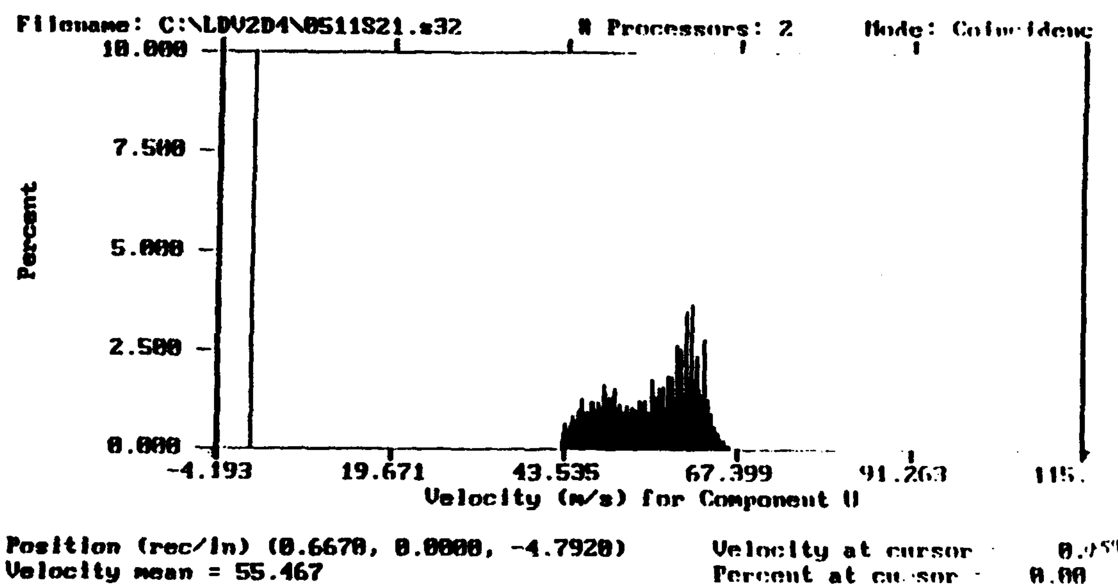


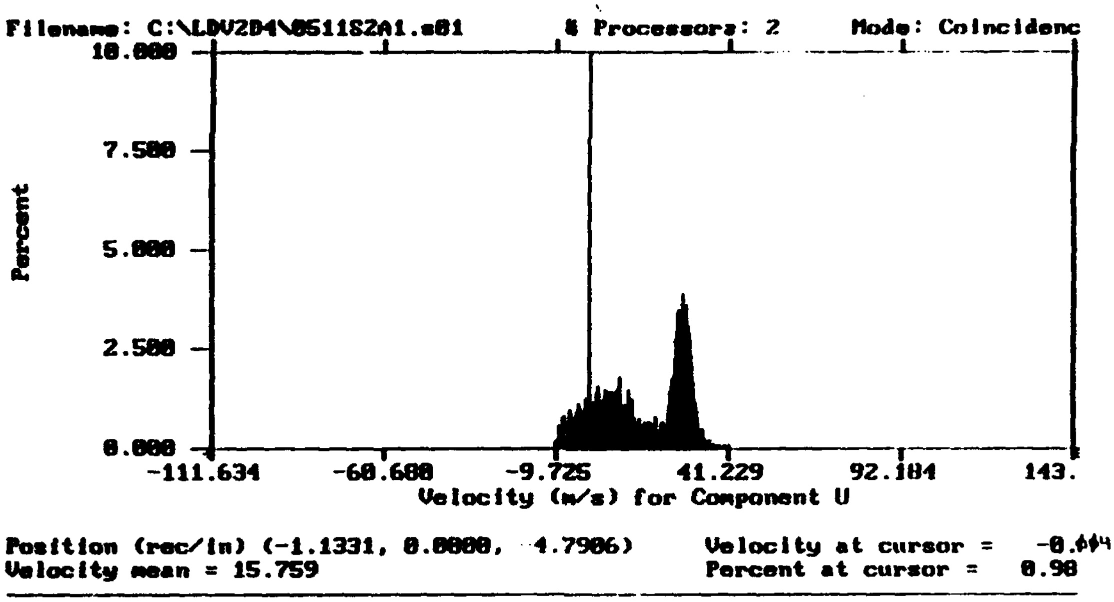


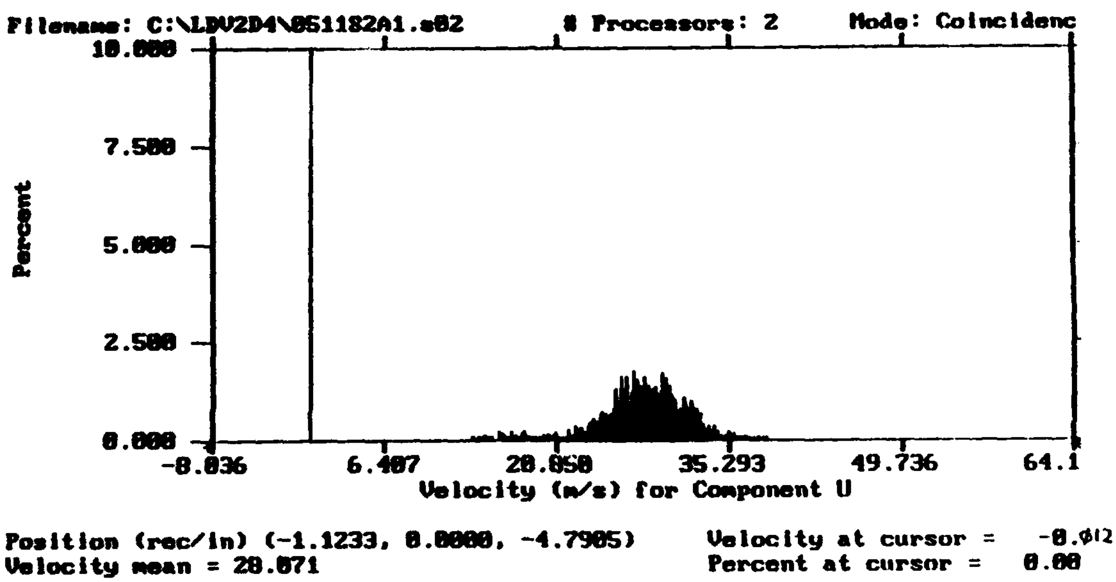
U/Vref - Hobson and Shreeve
V/Vref - Hobson and Shreeve
U/Vref - Present
X(in)

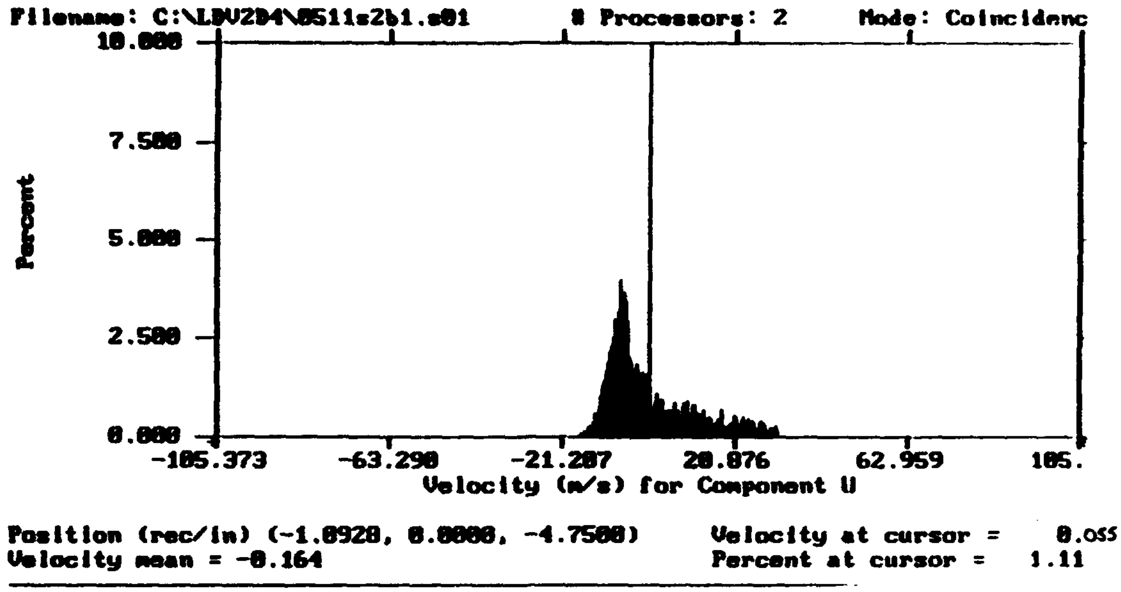
B. HISTOGRAMS FROM STATION 2 THROUGH 15 FOR 50 DEG

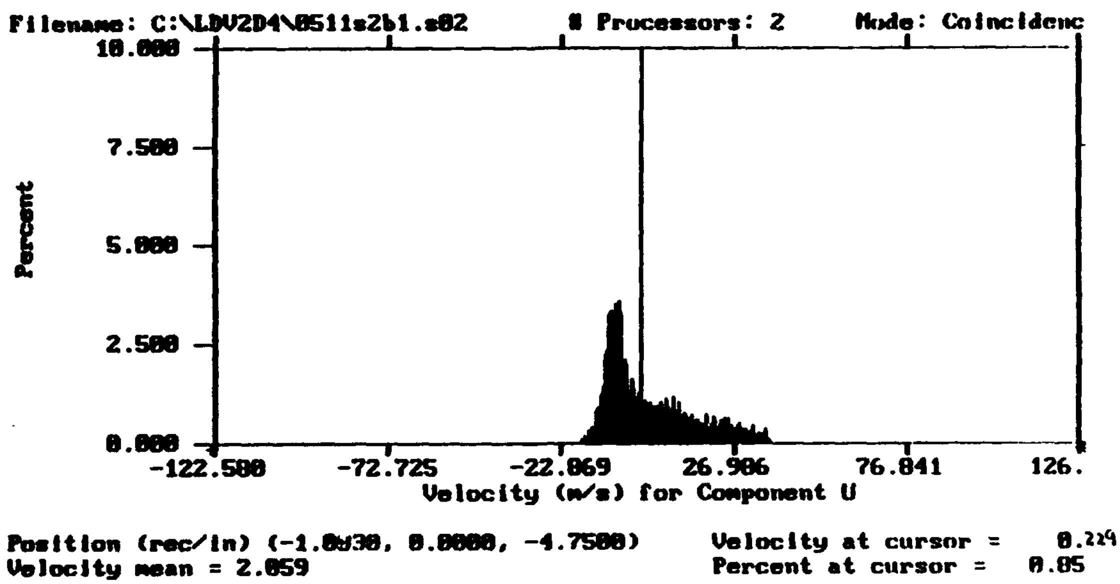




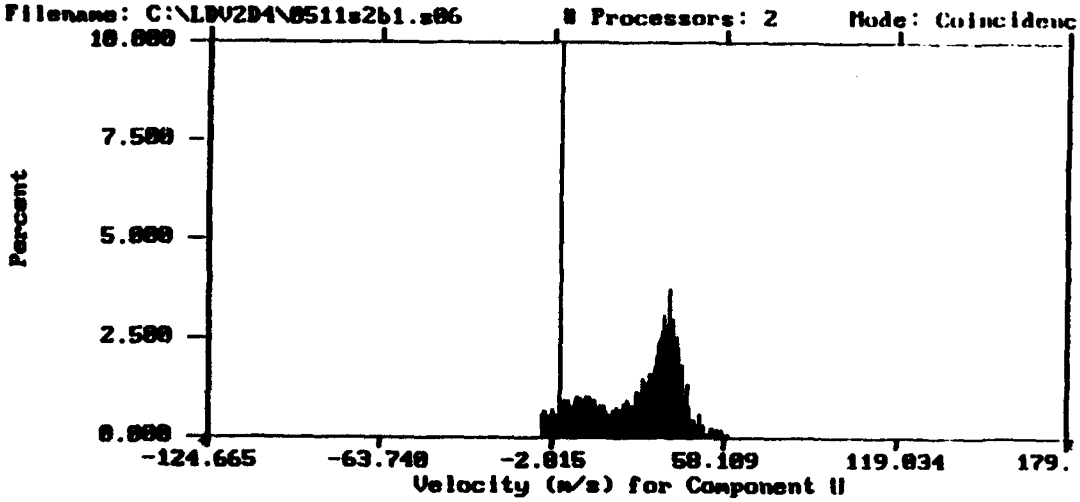

Filename: C:\LDV2D4\051182A1.s01
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-111.634
-60.680
-9.725
41.229
92.184
143.
Velocity (m/s) for Component U
Position (rec/in) (-1.1331, 0.0000, -4.7906)
Velocity at cursor = -0.004
Velocity mean = 15.759
Percent at cursor = 0.98


Filename: C:\LDV2D4\051182A1.s02
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-8.036
6.407
20.850
35.293
49.736
64.1
Velocity (m/s) for Component U
Position (rec/in) (-1.1233, 0.0000, -4.7905)
Velocity at cursor = -0.012
Velocity mean = 28.071
Percent at cursor = 0.00


Filename: C:\LDV2D4\0511s2b1.s01
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-105.373
-63.290
-21.207
20.876
62.959
105.
Velocity (m/s) for Component U
Position (rec/in) (-1.0920, 0.0000, -4.7500)
Velocity mean = -0.164
Velocity at cursor = 0.055
Percent at cursor = 1.11

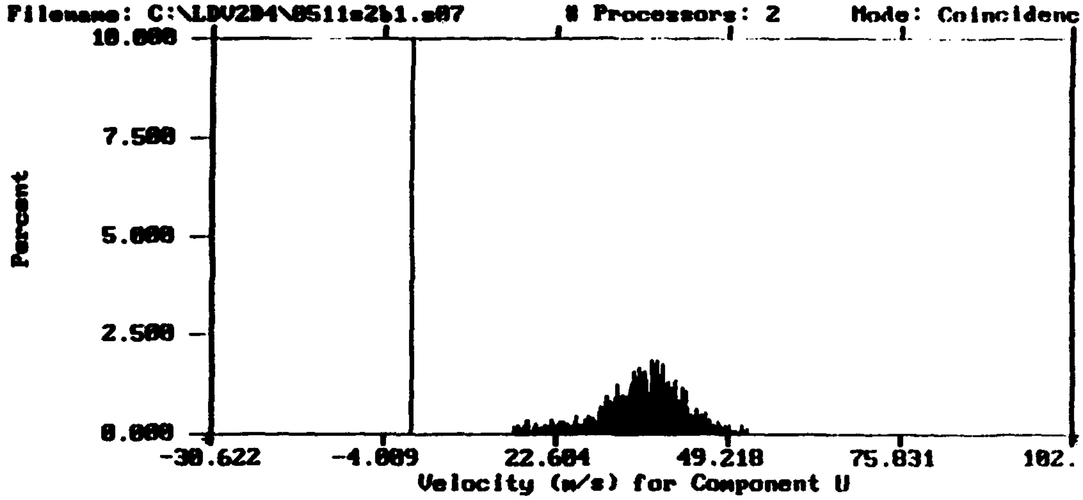

Filename: C:\LDV2D4\0511s2b1.s02
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-122.580
-72.725
-22.869
26.986
76.841
126.
Velocity (m/s) for Component U
Position (rec/in) (-1.0930, 0.0000, -4.7500)
Velocity mean = 2.059
Velocity at cursor = 0.229
Percent at cursor = 0.85

Filename: C:\LDV2D4\0511s2b1.s06 # Processors: 2 Mode: Coincidenc

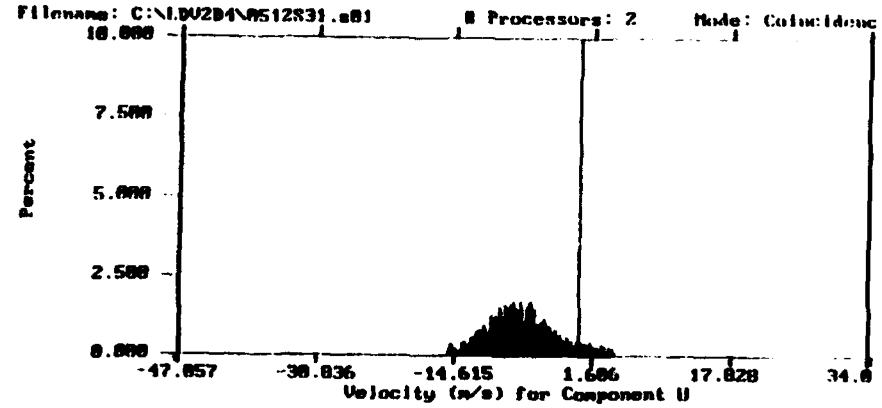


Position (rec/in) (-1.0321, 0.0000, -4.7500) Velocity at cursor = -0.133
Velocity mean = 27.647 Percent at cursor = 0.33

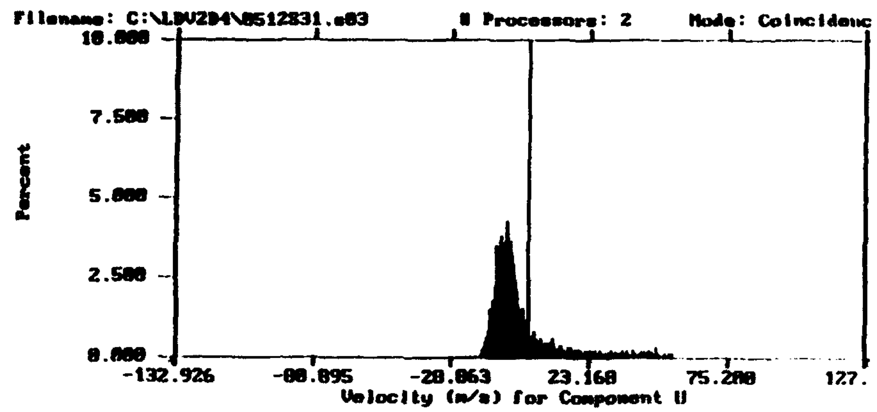
Filename: C:\LDV2D4\0511s2b1.s07 # Processors: 2 Mode: Coincidenc



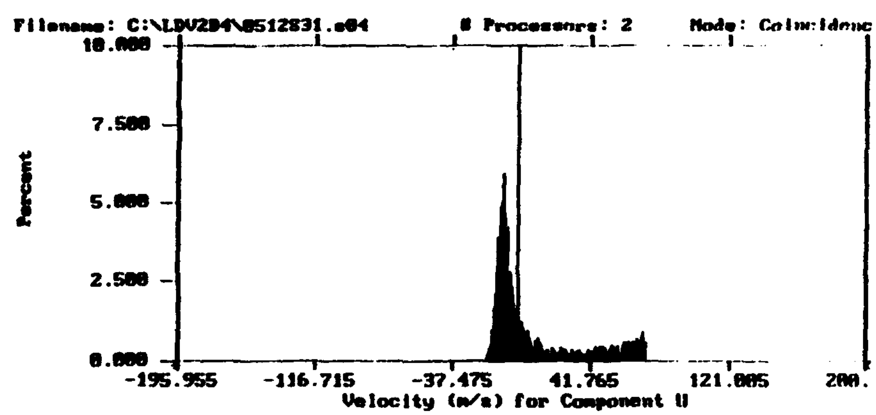
Position (rec/in) (-1.0162, 0.0000, -4.7500) Velocity at cursor = 0.069
Velocity mean = 35.911 Percent at cursor = 0.00



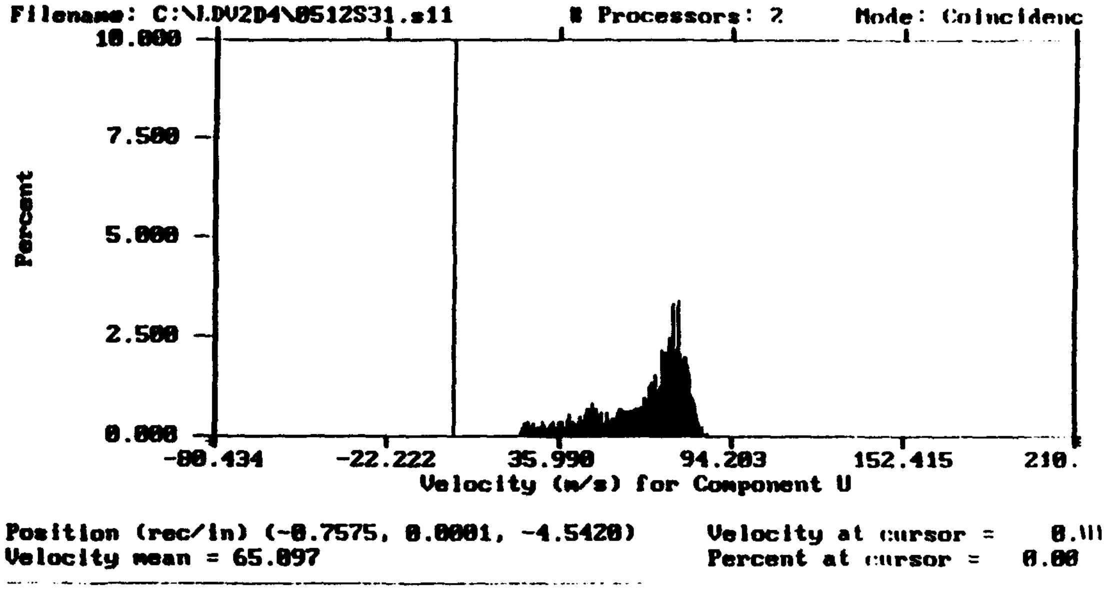
Position (rec/in) (-0.9160, 0.0000, -4.5420) Velocity at cursor = 0.0?8
Velocity mean = -6.512 Percent at cursor = 0.23

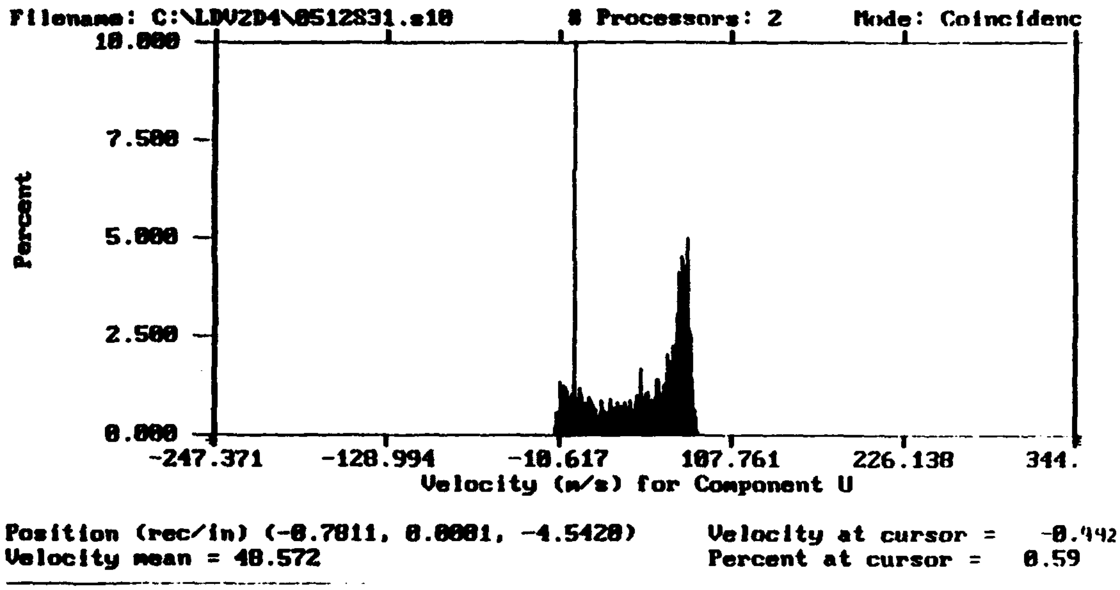


Position (rec/in) (-0.0951, 0.0001, -4.5420) Velocity at cursor = 0.152
Velocity mean = -2.858 Percent at cursor = 0.75

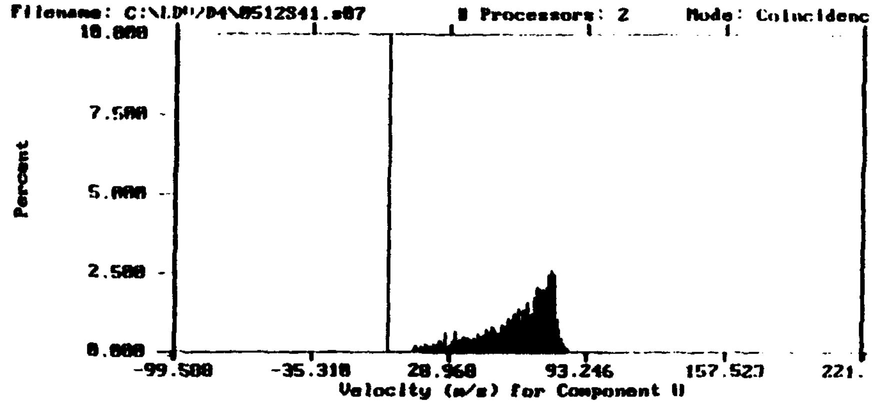


Position (rec/in) (-0.0031, 0.0001, -4.5420) Velocity at cursor = 0.061
Velocity mean = 0.149 Percent at cursor = 1.14


Filename: C:\LDV2D4\0512S31.s11
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-80.434
-22.222
35.990
94.203
152.415
210.
Velocity (m/s) for Component U
Position (rec/in) (-0.7575, 0.0001, -4.5420)
Velocity mean = 65.097
Velocity at cursor =
Percent at cursor = 0.00

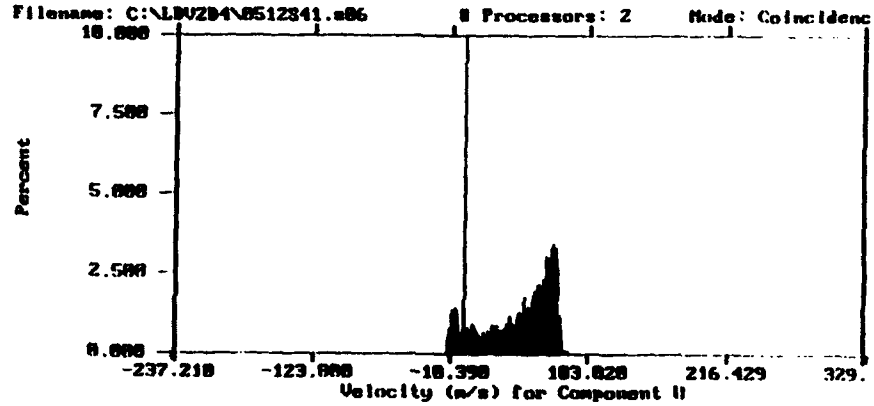

Filename: C:\LDV2D4\0512S31.s10
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-247.371
-128.994
-10.617
107.761
226.138
344.
Velocity (m/s) for Component U
Position (rec/in) (-0.7011, 0.0001, -4.5420)
Velocity mean = 40.572
Velocity at cursor = -0.442
Percent at cursor = 0.59

Filename: C:\LDV2D4\0512S41.s07 # Processors: 2 Mode: Coincidenc



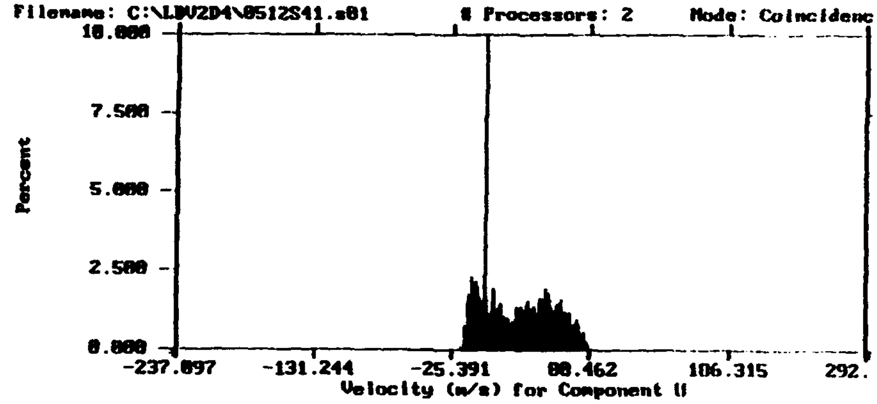
Position (rec/in) (-0.6339, 0.0001, -4.2920) Velocity at cursor = 0.
Velocity mean = 61.107 Percent at cursor = 0.00

Filename: C:\LDV2D4\0512S41.s06 # Processors: 2 Mode: Coincidenc

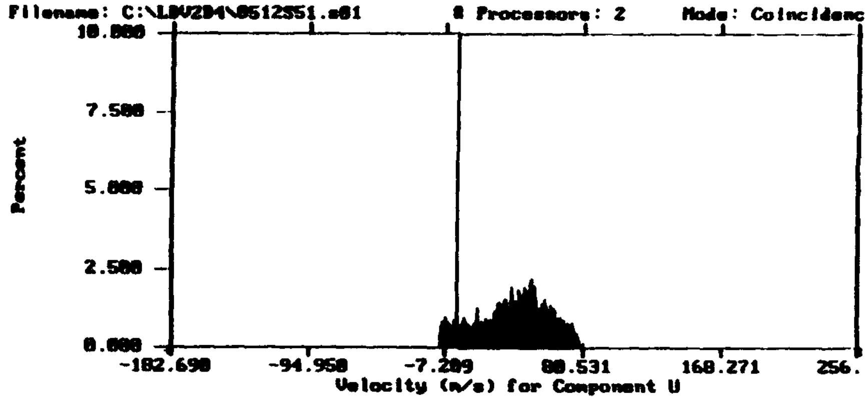


Position (rec/in) (-0.6490, 0.0001, -4.2920) Velocity at cursor = 0.
Velocity mean = 46.330 Percent at cursor = 0.75

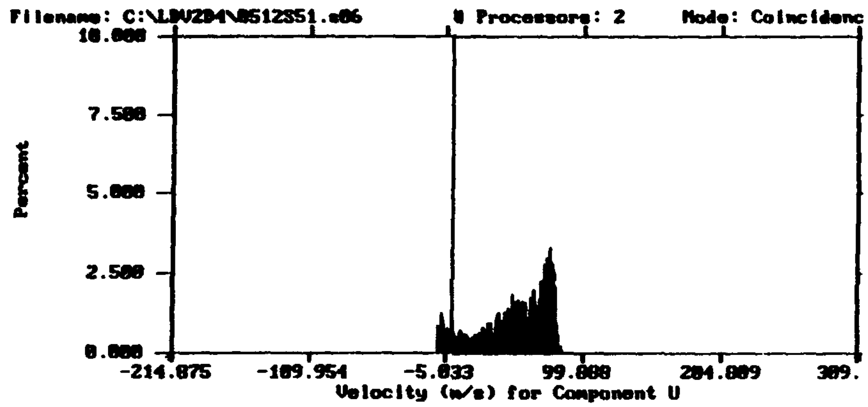
Filename: C:\LDV2D4\0512S41.s01 # Processors: 2 Mode: Coincidenc



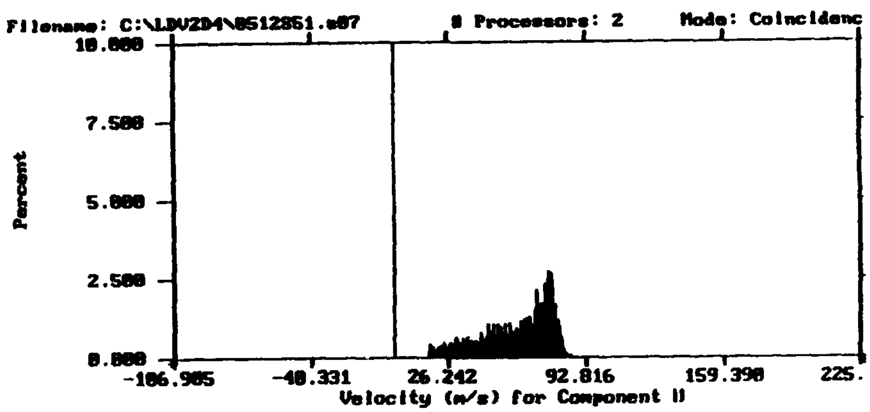
Position (rec/in) (-0.7107, 0.0001, -4.2920) Velocity at cursor = 0.
Velocity mean = 27.553 Percent at cursor = 1.40



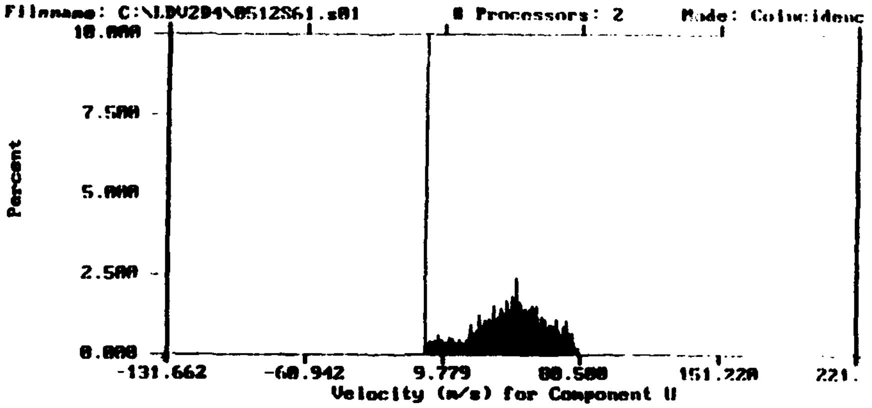
Position (rec/in) (-0.5409, 0.0001, -4.0420)   Velocity at cursor = 0.532
Velocity mean = 36.661   Percent at cursor = 0.39



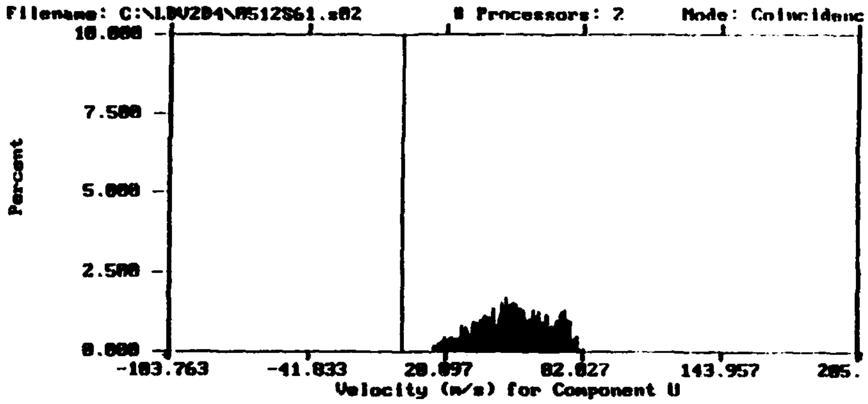
Position (rec/in) (-0.4002, 0.0001, -4.0419)   Velocity at cursor = -0.414
Velocity mean = 47.420   Percent at cursor = 0.39



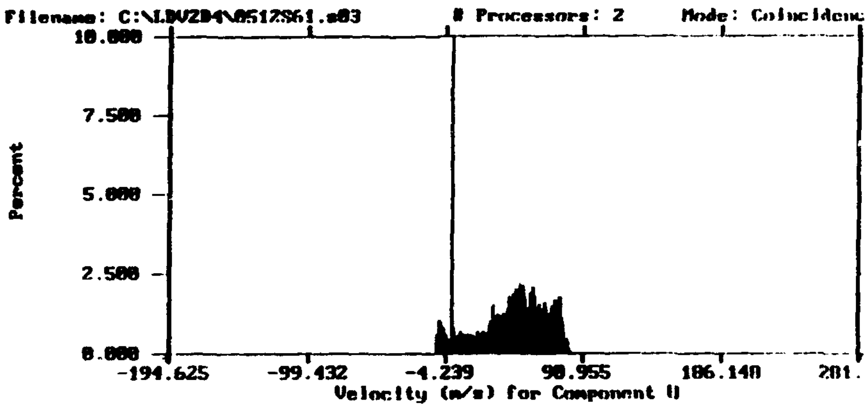
Position (rec/in) (-0.4642, 0.0001, -4.0420)   Velocity at cursor = -0.136
Velocity mean = 59.529   Percent at cursor = 0.00



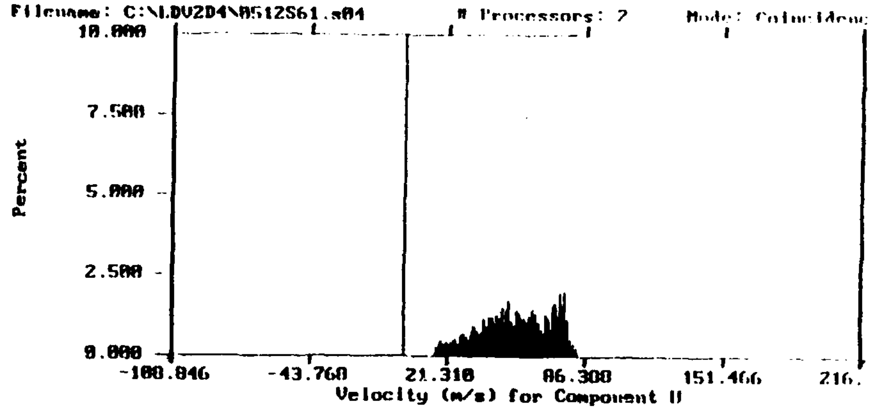
Position (rec/in) (-0.3825, 0.0001, -3.7919) Velocity at cursor = 0.2%
Velocity mean = 45.139 Percent at cursor = 0.00



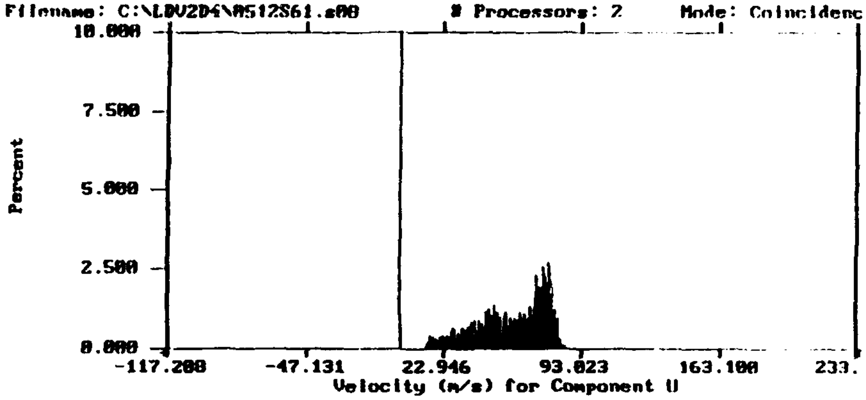
Position (rec/in) (-0.3725, 0.0001, -3.7920) Velocity at cursor = 0.103
Velocity mean = 51.062 Percent at cursor = 0.00



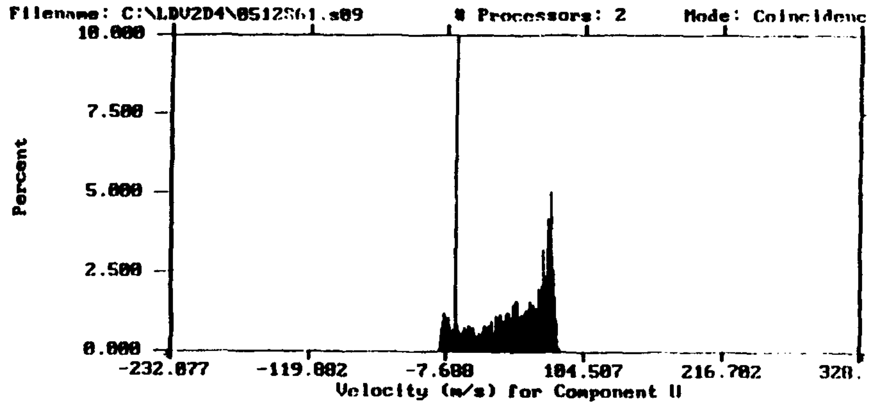
Position (rec/in) (-0.3614, 0.0001, -3.7920) Velocity at cursor = 0.017
Velocity mean = 43.358 Percent at cursor = 0.49



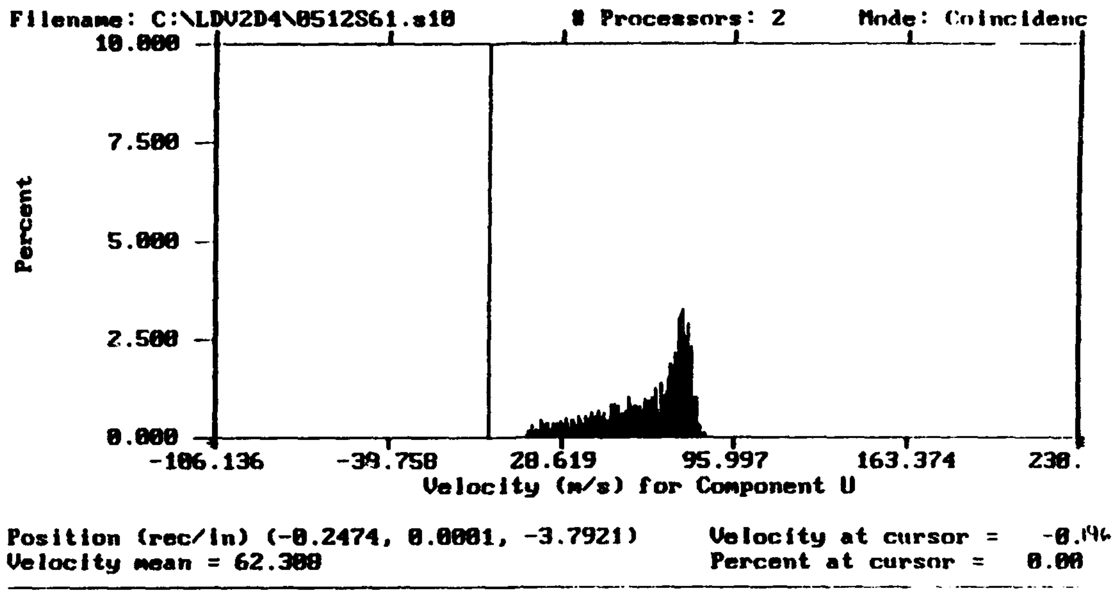
Position (rec/in) (-0.3494, 0.0001, -3.7920) Velocity at cursor = 0.2??
Velocity mean = 53.849 Percent at cursor = 0.00

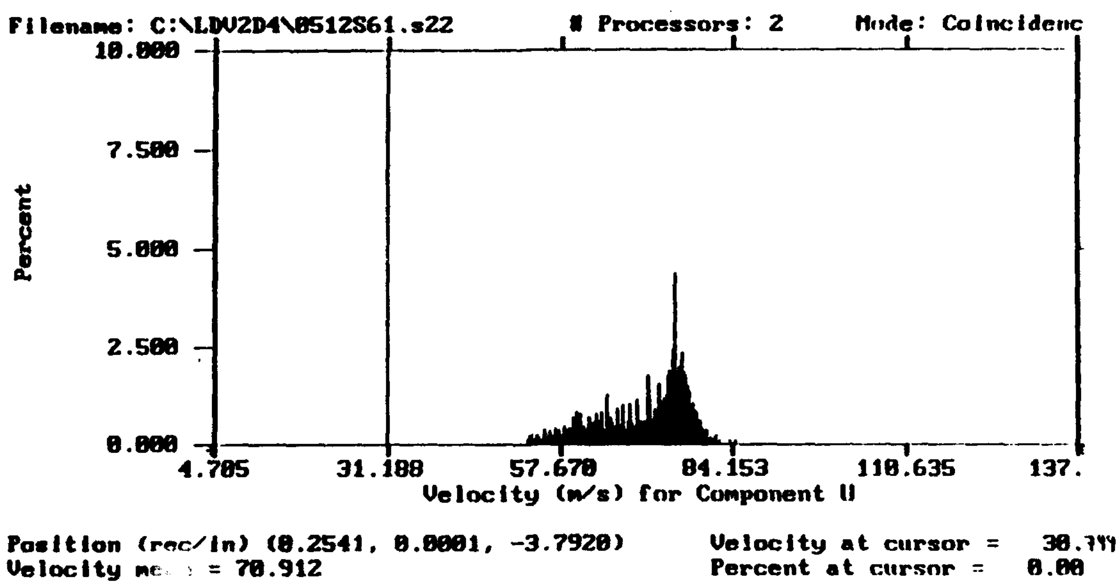


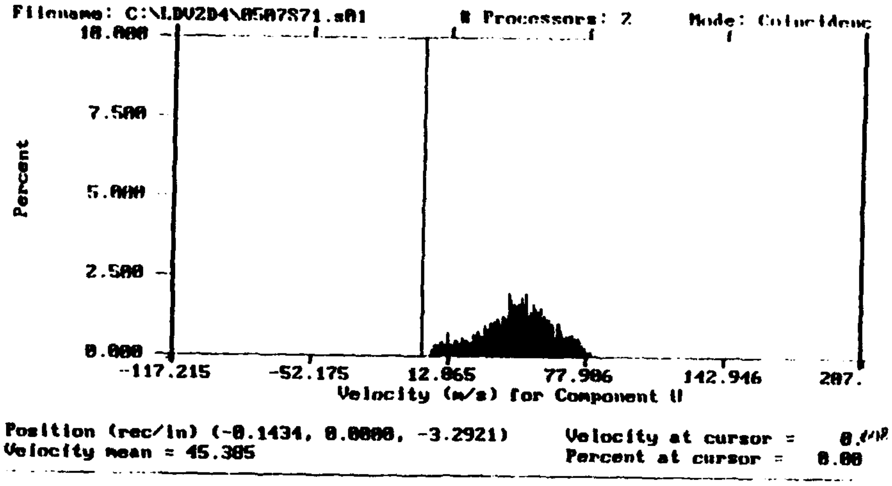
Position (rec/in) (-0.2808, 0.0001, -3.7920) Velocity at cursor = 0.321
Velocity mean = 57.984 Percent at cursor = 0.00

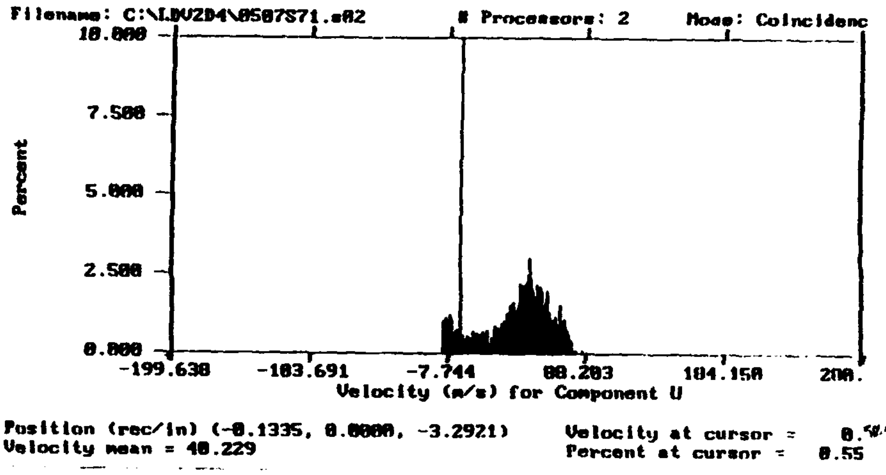


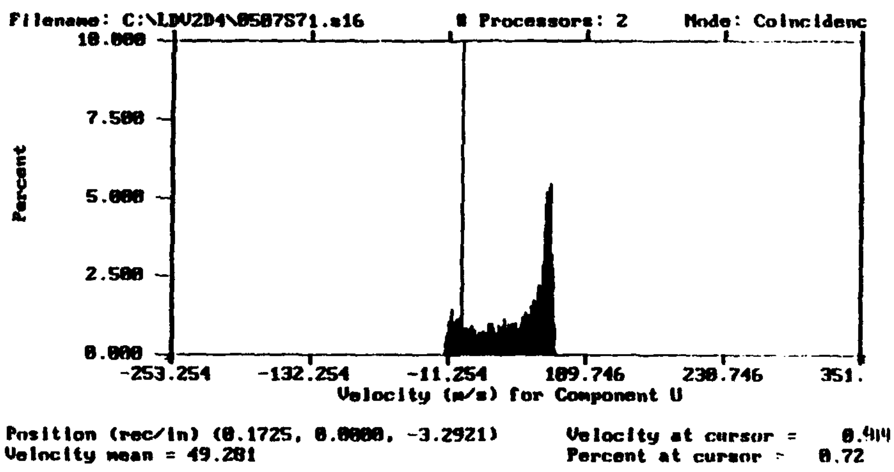
Position (rec/in) (-0.2600, 0.0001, -3.7921) Velocity at cursor = 0.5??
Velocity mean = 40.410 Percent at cursor = 0.55

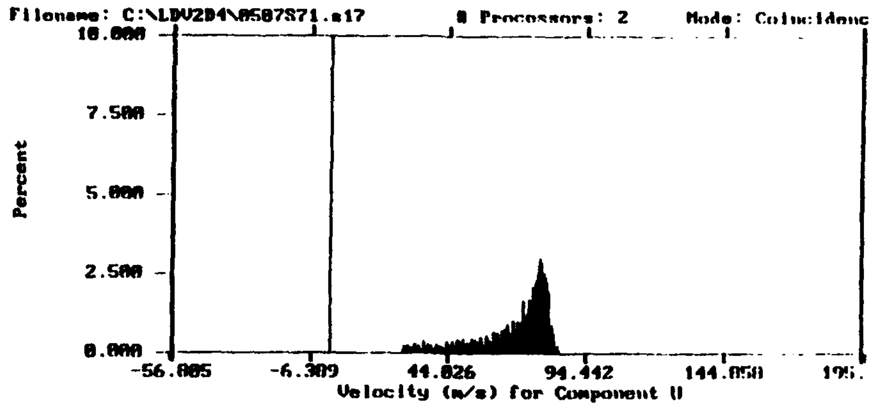

Filename: C:\LDV2D4\0512S61.s10
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-106.136
-39.758
28.619
95.997
163.374
230.
Velocity (m/s) for Component U
Position (rec/in) (-0.2474, 0.0001, -3.7921)
Velocity at cursor =
Velocity mean = 62.300
Percent at cursor = 0.00


Filename: C:\LDV2D4\0512S61.s22
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
4.705
31.188
57.670
84.153
110.635
137.
Velocity (m/s) for Component U
Position (rec/in) (0.2541, 0.0001, -3.7920)
Velocity at cursor =
= 70.912
Percent at cursor = 0.00

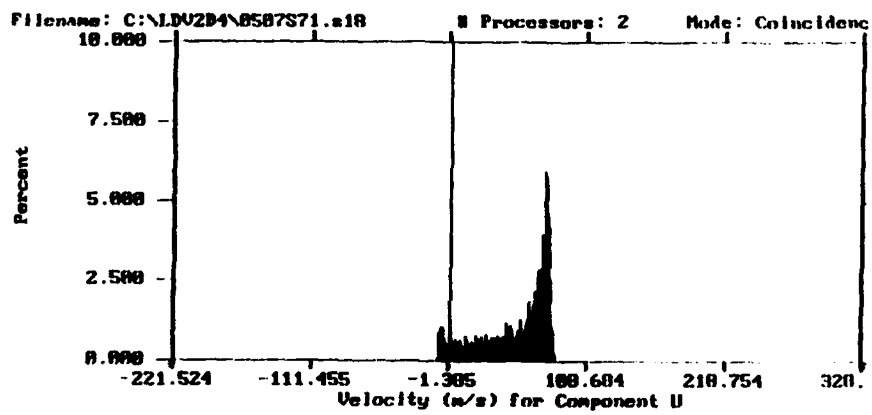

Filename: C:\LDV2D4\0507S71.s01
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-117.215
-52.175
12.865
77.906
142.946
207.
Velocity (m/s) for Component U
Position (rec/in) (-0.1434, 0.0000, -3.2921)
Velocity mean = 45.385
Velocity at cursor =
Percent at cursor = 0.00


Filename: C:\LDV2D4\0507S71.s02
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-199.638
-103.691
-7.744
88.203
184.150
280.
Velocity (m/s) for Component U
Position (rec/in) (-0.1335, 0.0000, -3.2921)
Velocity mean = 40.229
Velocity at cursor =
Percent at cursor = 0.55

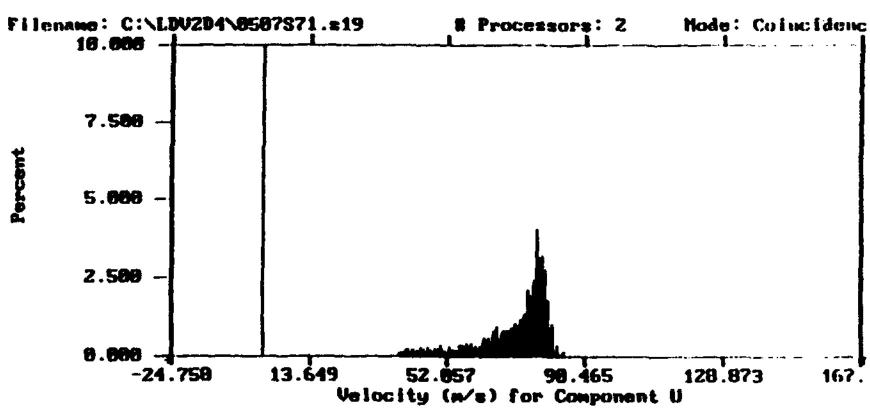

Filename: C:\LDV2D4\0507S71.s16
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-253.254
-132.254
-11.254
109.746
230.746
351.
Velocity (m/s) for Component U
Position (rec/in) (0.1725, 0.0000, -3.2921)
Velocity mean = 49.281
Velocity at cursor =
Percent at cursor = 0.72



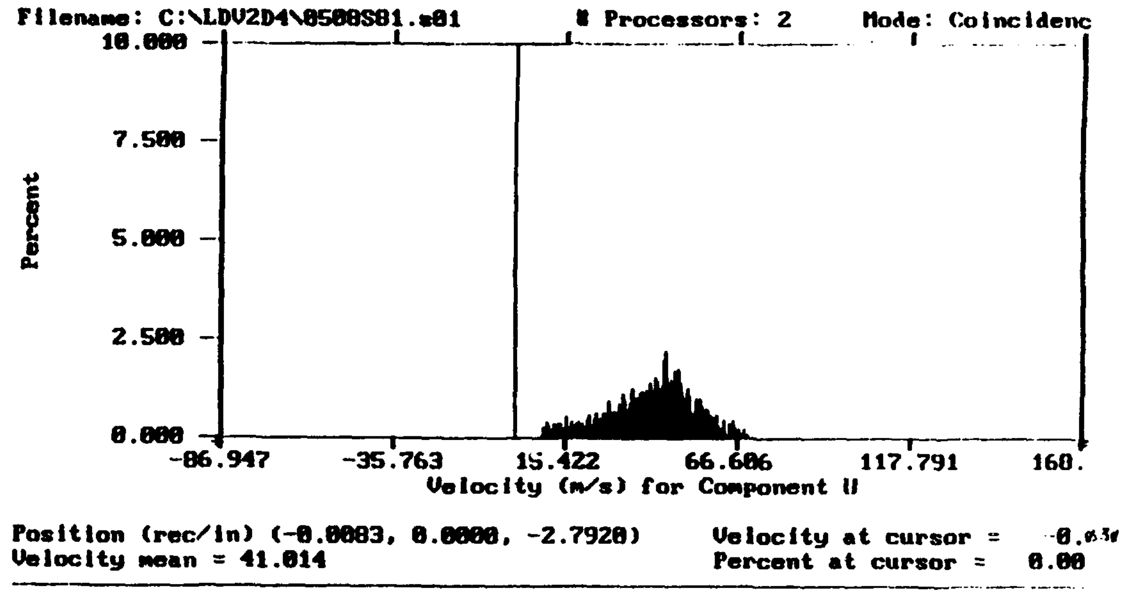
Position (rec/in) (0.2141, 0.0000, -3.2921) Velocity at cursor = 0.269
Velocity mean = 69.234 Percent at cursor = 0.00

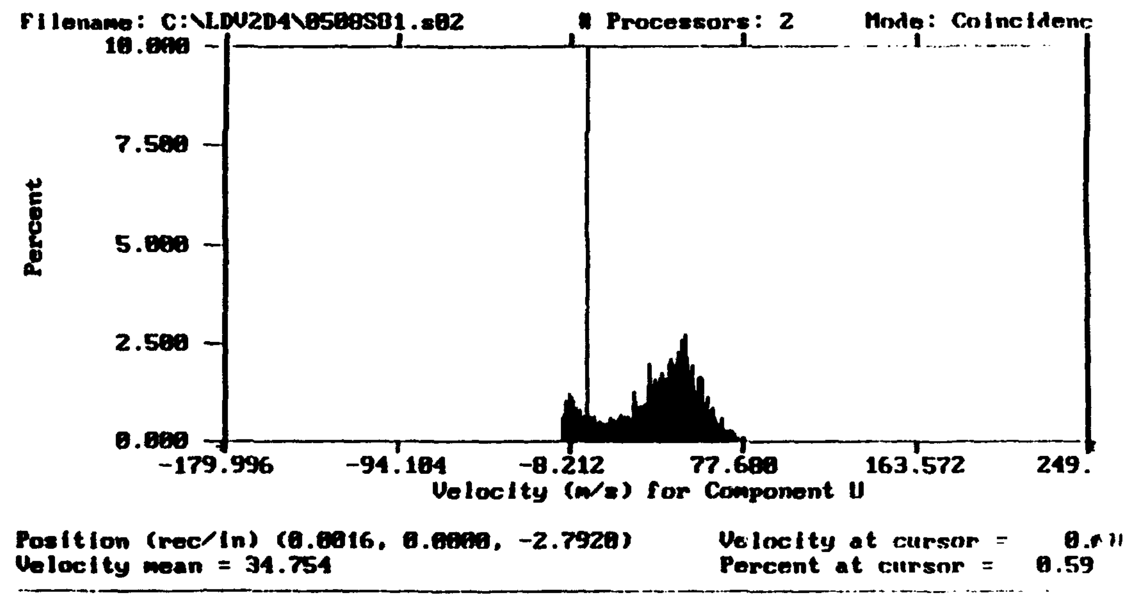


Position (rec/in) (0.2598, 0.0000, -3.2921) Velocity at cursor = -0.[illegible]
Velocity mean = 53.650 Percent at cursor = 1.14

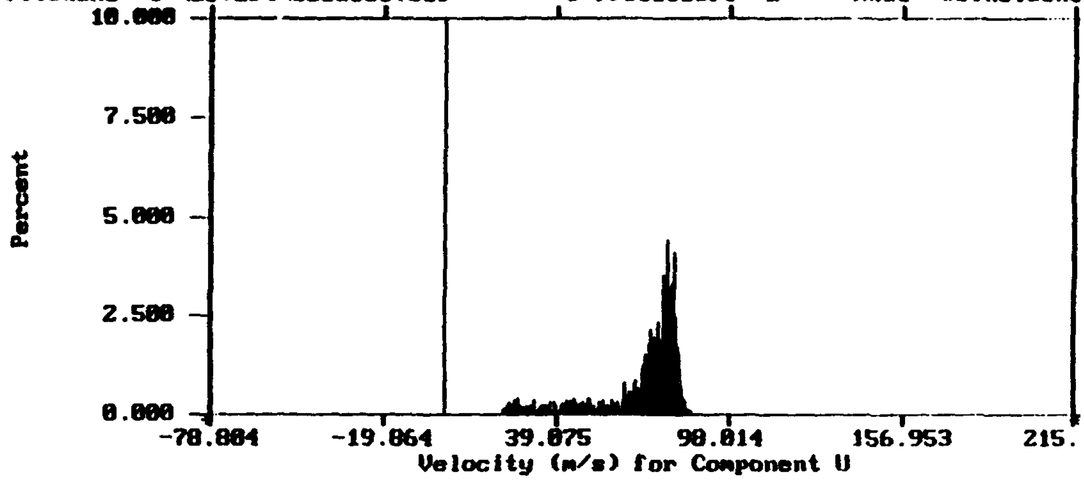


Position (rec/in) (0.3100, 0.0000, -3.2921) Velocity at cursor = 0.[illegible]
Velocity mean = 71.261 Percent at cursor = 0.00


Filename: C:\LDV2D4\0500S01.s01
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-86.947
-35.763
15.422
66.606
117.791
168.
Velocity (m/s) for Component U
Position (rec/in) (-0.0083, 0.0000, -2.7920)
Velocity at cursor =
Velocity mean = 41.014
Percent at cursor = 0.00

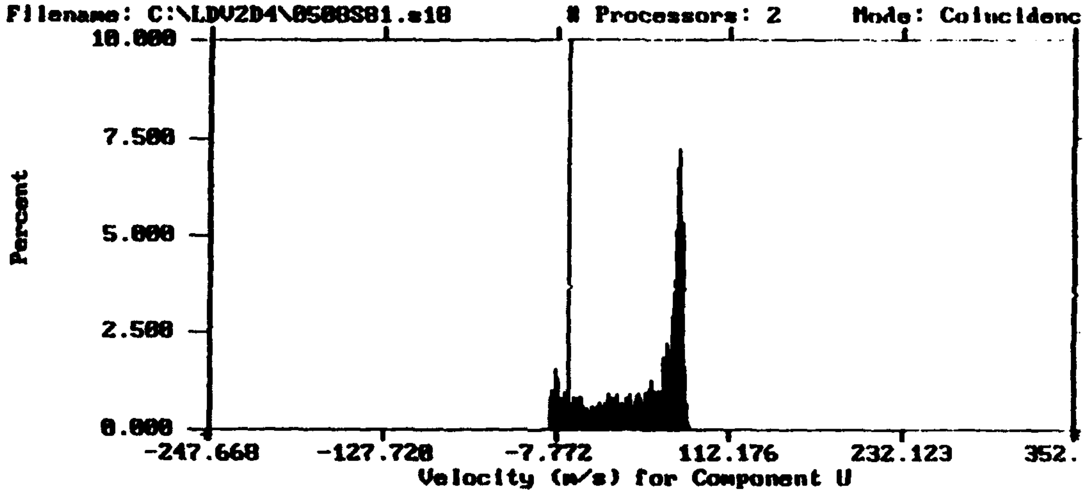

Filename: C:\LDV2D4\0500S01.s02
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-179.996
-94.104
-8.212
77.680
163.572
249.
Velocity (m/s) for Component U
Position (rec/in) (0.0016, 0.0000, -2.7920)
Velocity at cursor =
Velocity mean = 34.754
Percent at cursor = 0.59

Filename: C:\LDV2D4\0500S01.s19 # Processors: 2 Mode: Coincidenc

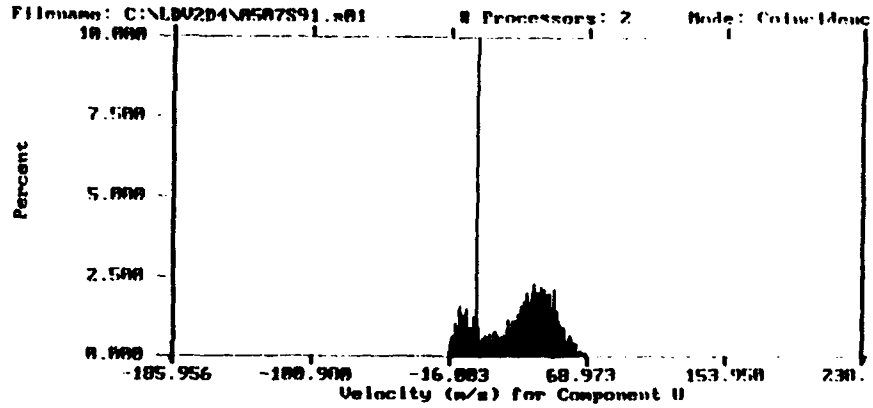


Position (rec/in) (0.4451, -0.0001, -2.7920) Velocity at cursor = 0.216
Velocity mean = 60.545 Percent at cursor = 0.00

Filename: C:\LDV2D4\0500S01.s18 # Processors: 2 Mode: Coincidenc

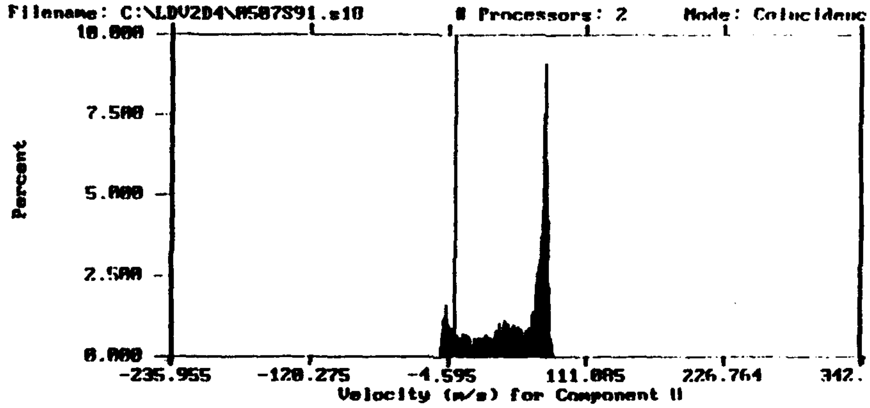


Position (rec/in) (0.3949, -0.0001, -2.7920) Velocity at cursor = 0.023
Velocity mean = 52.202 Percent at cursor = 0.65



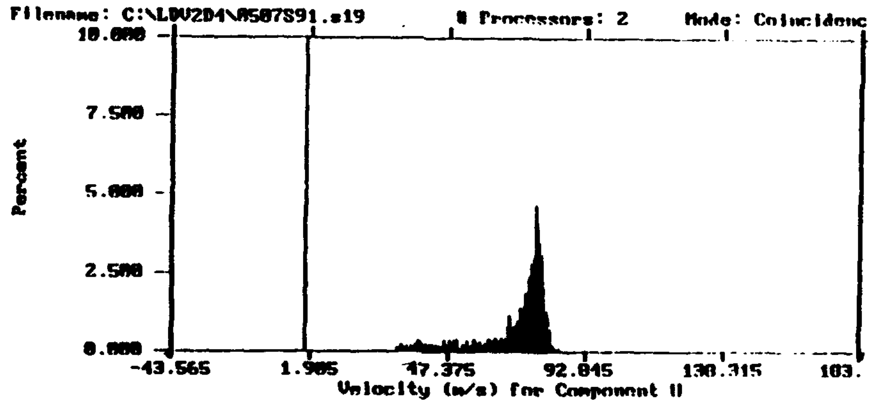
Position (rec/in) (0.0062, -0.0001, -2.2920)
Velocity mean = 26.493

Velocity at cursor - 0.3
Percent at cursor - 0.60



Position (rec/in) (0.4094, -0.0001, -2.2920)
Velocity mean = 53.267

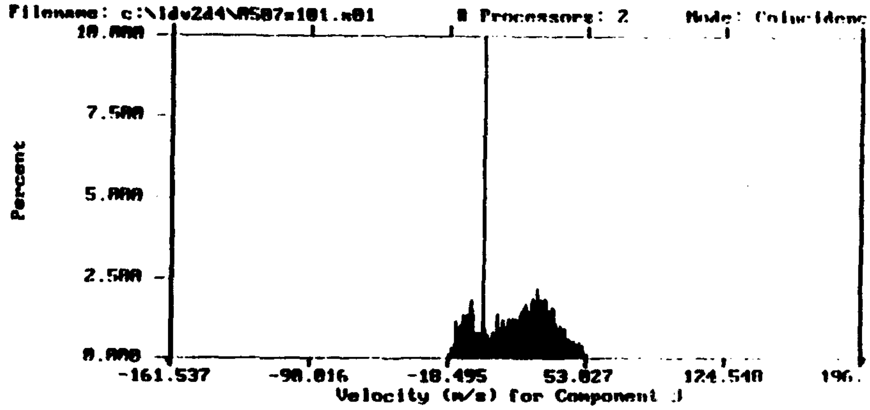
Velocity at cursor = 0.
Percent at cursor - 0.52



Position (rec/in) (0.5397, -0.0001, -2.2920)
Velocity mean = 70.118

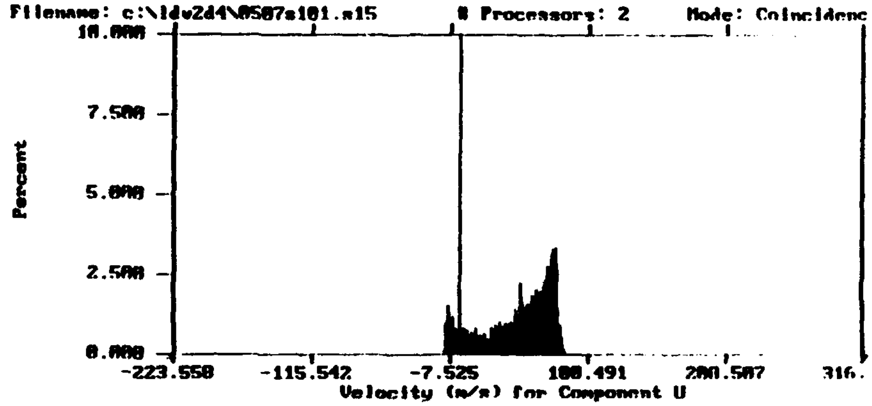
Velocity at cursor - 0.
Percent at cursor - 0.00

Filename: c:\ldv2d4\0507s101.s01 # Processors: 2 Mode: Coincidenc



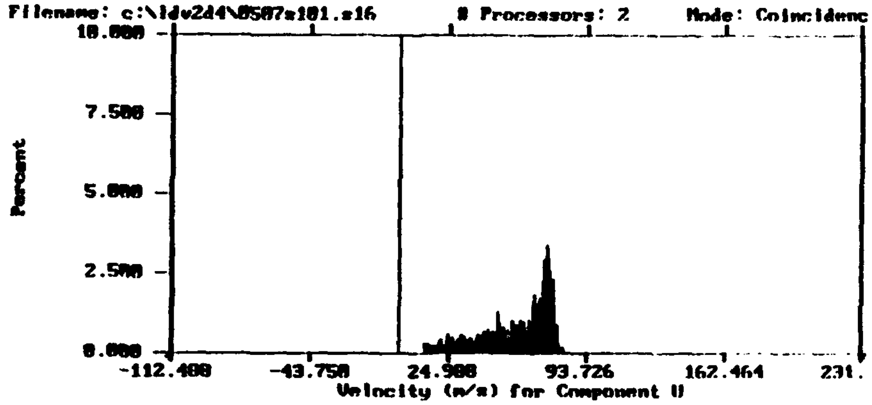
Position (rec/in) (0.1286, -0.0001, -1.7920) Velocity at cursor - 0.552
Velocity mean = 17.262 Percent at cursor - 0.98

Filename: c:\ldv2d4\0507s101.s15 # Processors: 2 Mode: Coincidenc

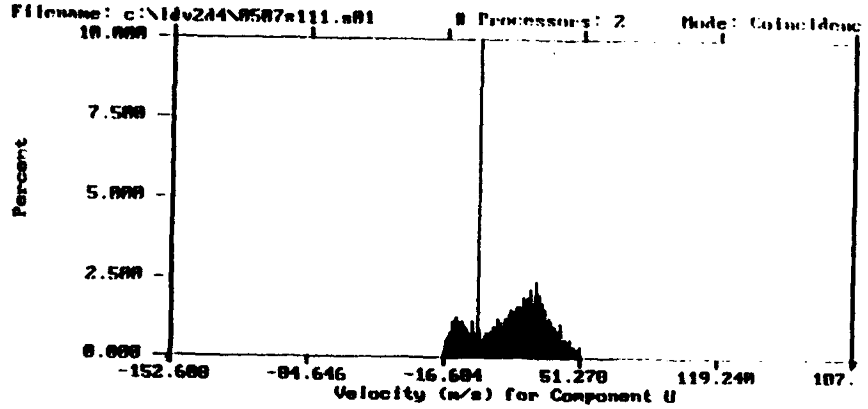


Position (rec/in) (0.3988, -0.0001, -1.7920) Velocity at cursor - -0.566
Velocity mean = 46.474 Percent at cursor - 0.55

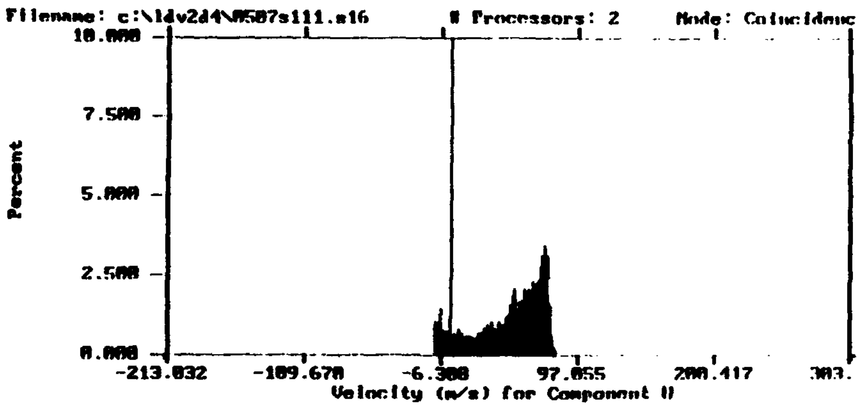
Filename: c:\ldv2d4\0507s101.s16 # Processors: 2 Mode: Coincidenc



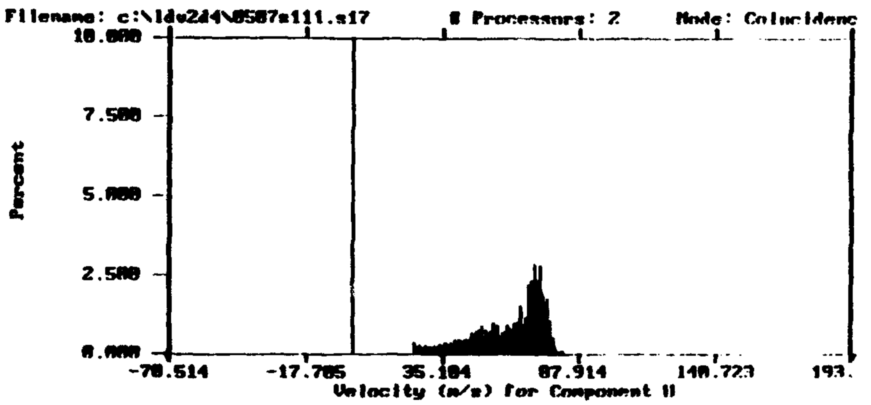
Position (rec/in) (0.4365, -0.0001, -1.7920) Velocity at cursor - 0.687
Velocity mean = 59.370 Percent at cursor - 0.00



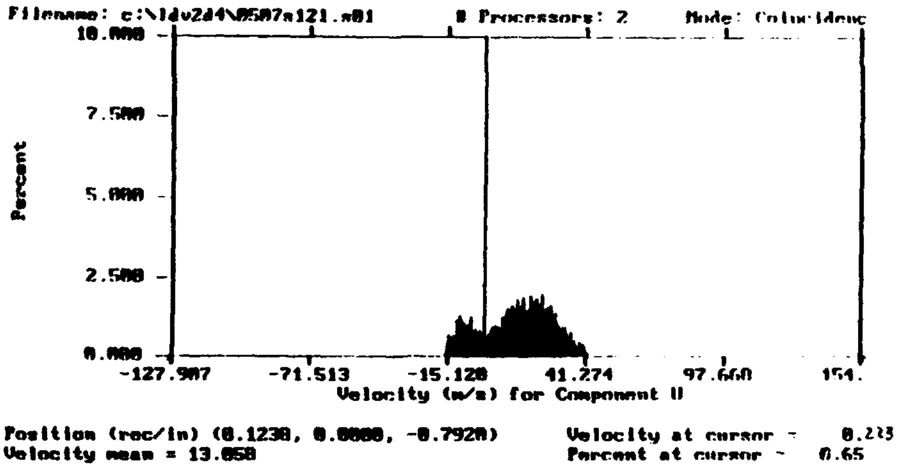
Position (rec/in) (0.1435, 0.0000, -1.2920)
Velocity mean = 17.387
Velocity at cursor = -0.156
Percent at cursor = 0.39

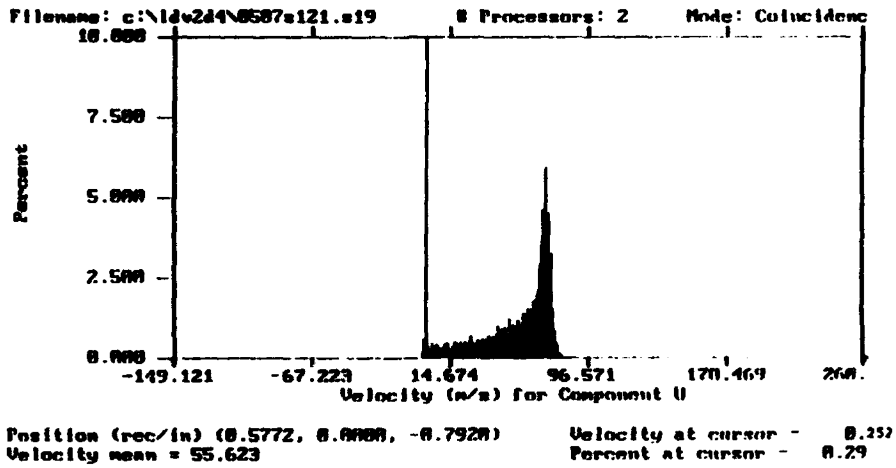


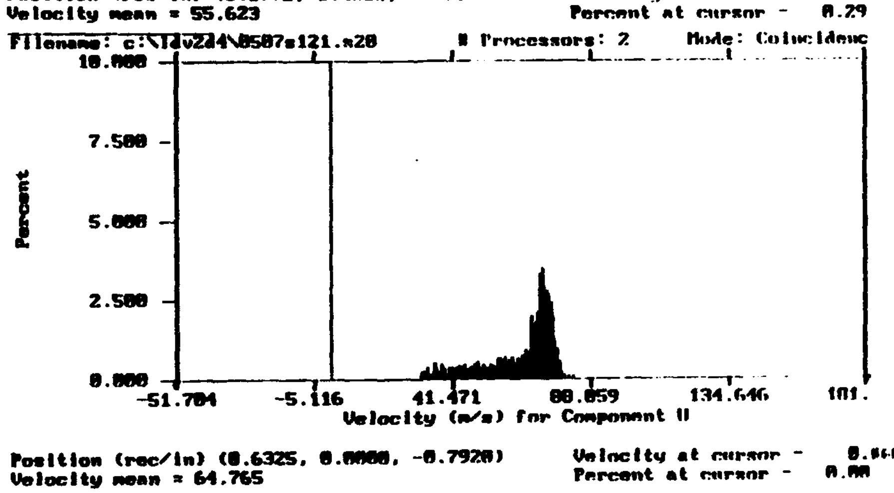
Position (rec/in) (0.4594, 0.0000, -1.2921)
Velocity mean = 45.363
Velocity at cursor =
Percent at cursor = 0.59



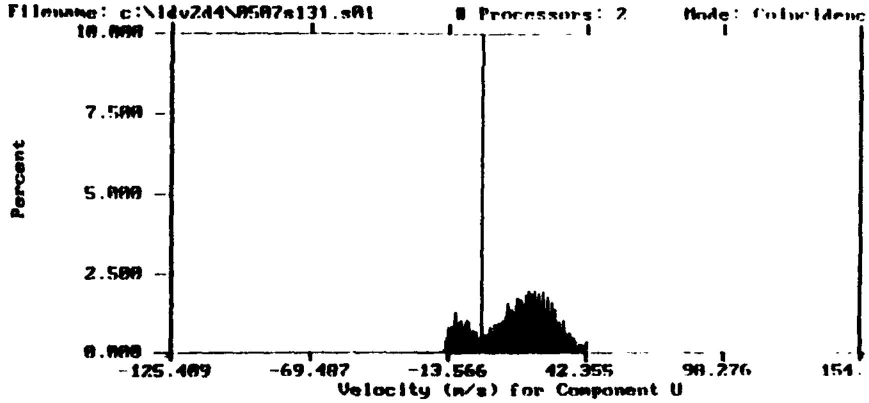
Position (rec/in) (0.5809, 0.0000, -1.2920)
Velocity mean = 61.510
Velocity at cursor = -0.215
Percent at cursor = 0.00


Filename: c:\ldv2d4\0507a121.s01
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-127.907
-71.513
-15.120
41.274
97.660
154.
Velocity (m/s) for Component U
Position (rec/in) (0.1230, 0.0000, -0.7920)
Velocity mean = 13.058
Velocity at cursor = 0.233
Percent at cursor = 0.65


Filename: c:\ldv2d4\0507a121.s19
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-149.121
-67.223
14.674
96.571
178.469
260.
Velocity (m/s) for Component U
Position (rec/in) (0.5772, 0.0000, -0.7920)
Velocity mean = 55.623
Velocity at cursor = 0.252
Percent at cursor = 0.29

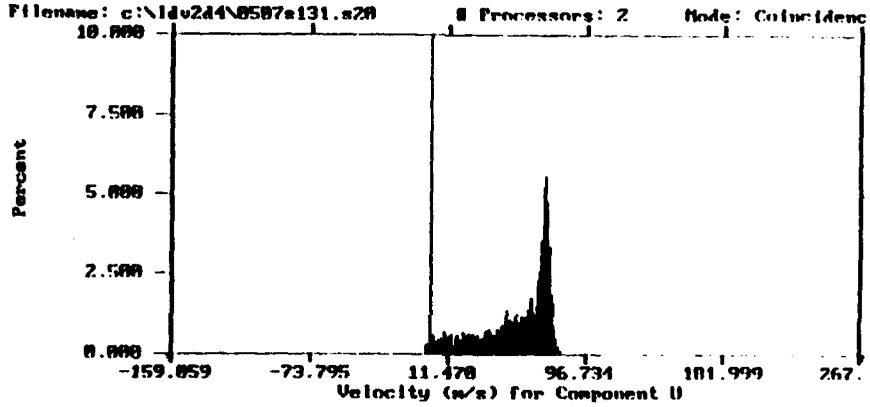

Filename: c:\ldv2d4\0507a121.s28
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-51.704
-5.116
41.471
88.059
134.646
181.
Velocity (m/s) for Component U
Position (rec/in) (0.6325, 0.0000, -0.7920)
Velocity mean = 64.765
Velocity at cursor = 0.868
Percent at cursor = 0.00

Filename: c:\ldv244\0507s131.s01 # Processors: 2 Mode: Coincidenc



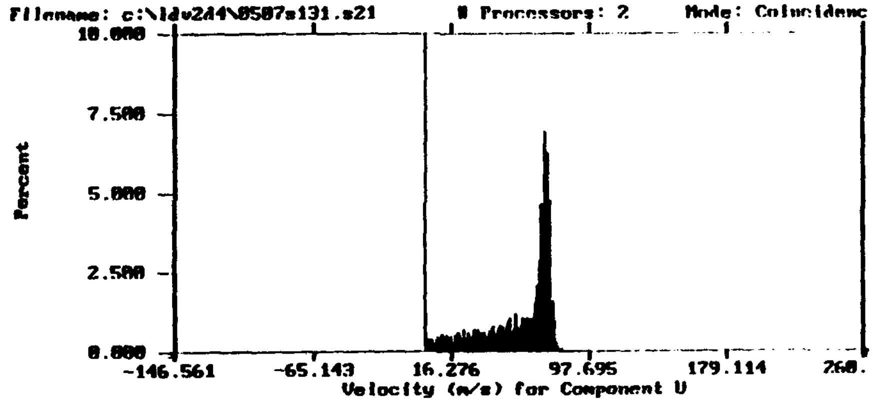
Position (rec/in) (0.1230, 0.0000, -0.5000) Velocity at cursor = 0.635
Velocity mean = 14.300 Percent at cursor = 0.20

Filename: c:\ldv244\0507s131.s20 # Processors: 2 Mode: Coincidenc

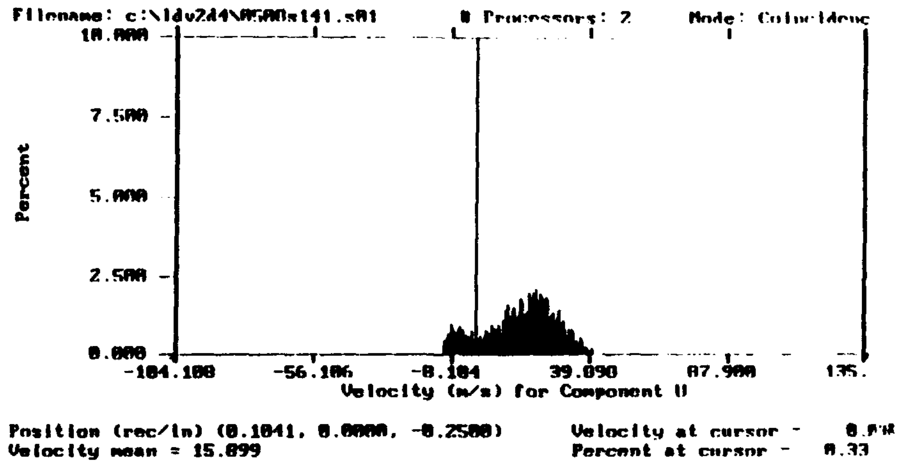


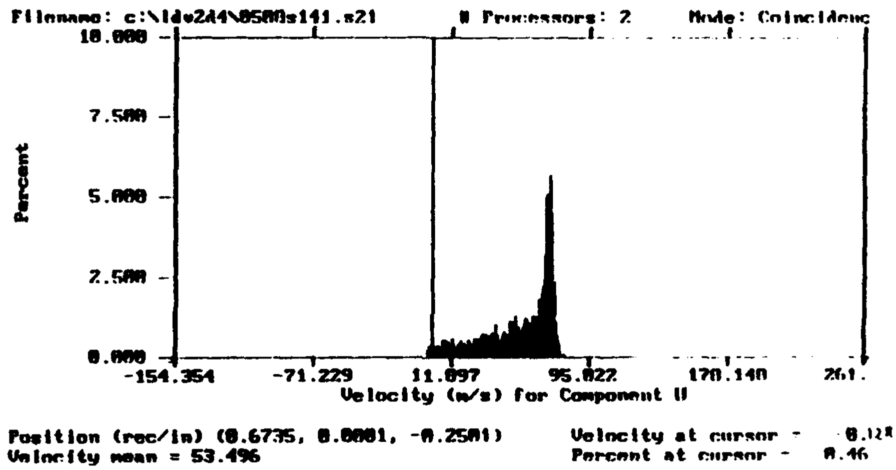
Position (rec/in) (0.6325, 0.0000, -0.4999) Velocity at cursor = 0.0
Velocity mean = 54.100 Percent at cursor = 0.42

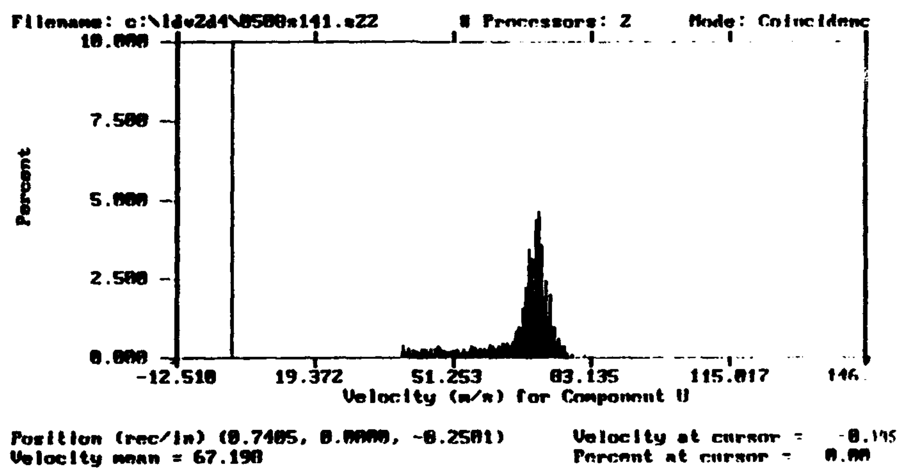
Filename: c:\ldv244\0507s131.s21 # Processors: 2 Mode: Coincidenc

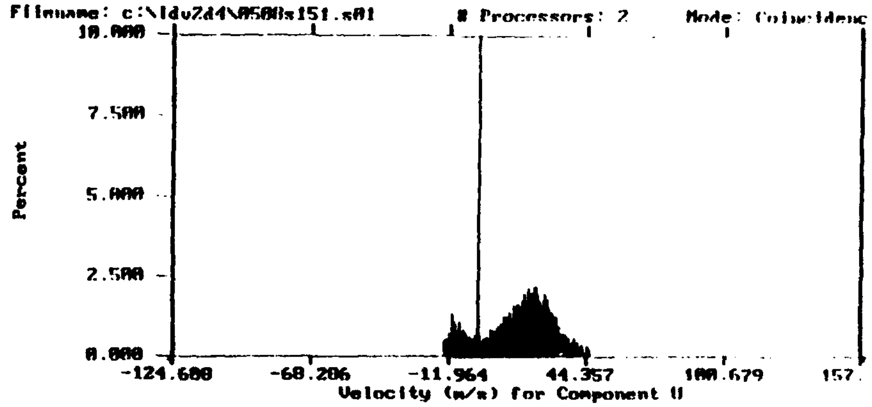


Position (rec/in) (0.6933, 0.0000, -0.4999) Velocity at cursor = 0.131
Velocity mean = 56.998 Percent at cursor = 0.13

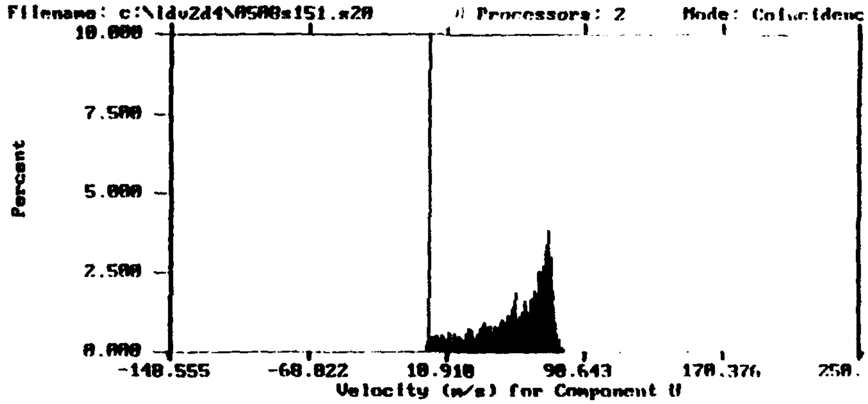

Filename: c:\ldv2d4\0500s141.s01
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-104.100
-56.106
-8.104
39.090
87.900
135.
Velocity (m/s) for Component U
Position (rec/in) (0.1041, 0.0000, -0.2500)
Velocity mean = 15.899
Velocity at cursor =
Percent at cursor = 0.33


Filename: c:\ldv2d4\0500s141.s21
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-154.354
-71.229
11.897
95.022
178.140
261.
Velocity (m/s) for Component U
Position (rec/in) (0.6735, 0.0001, -0.2501)
Velocity mean = 53.496
Velocity at cursor =
Percent at cursor = 0.46

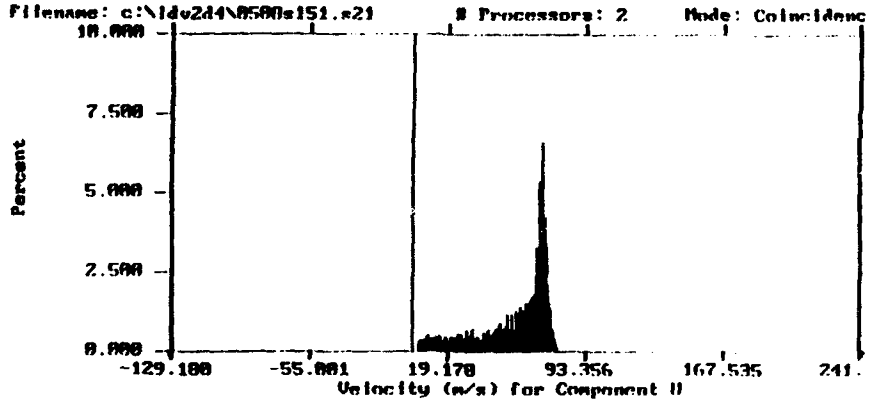

Filename: c:\ldv2d4\0500s141.s22
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-12.510
19.372
51.253
83.135
115.017
146.
Velocity (m/s) for Component U
Position (rec/in) (0.7405, 0.0000, -0.2501)
Velocity mean = 67.198
Velocity at cursor =
Percent at cursor = 0.00



Position (rec/in) (0.1023, 0.0000, 0.0001) Velocity at cursor =
Velocity mean = 16.194 Percent at cursor = 0.42

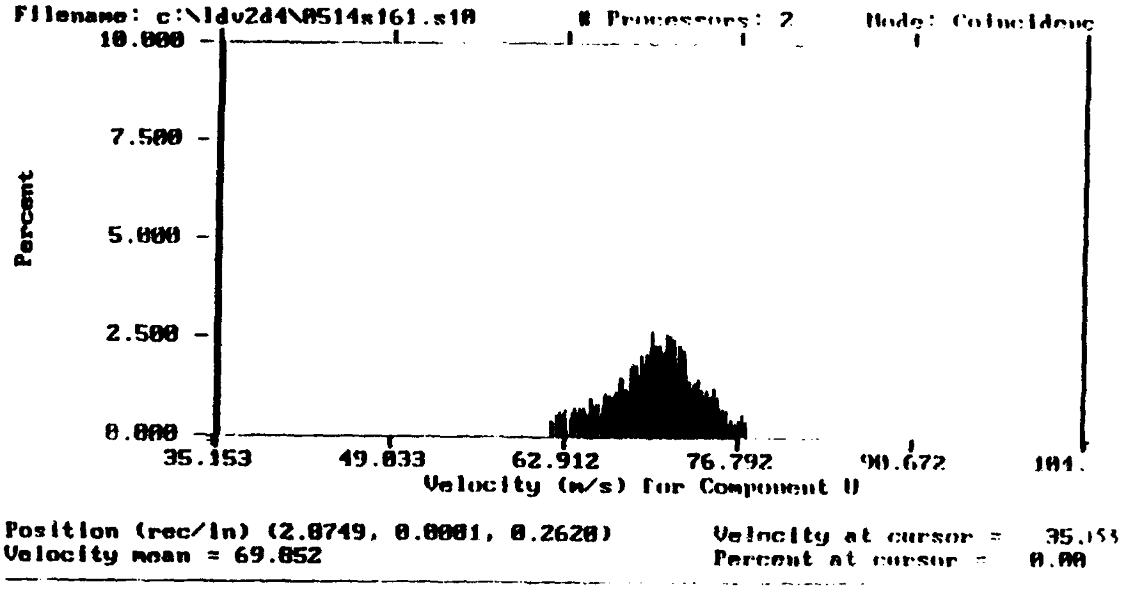


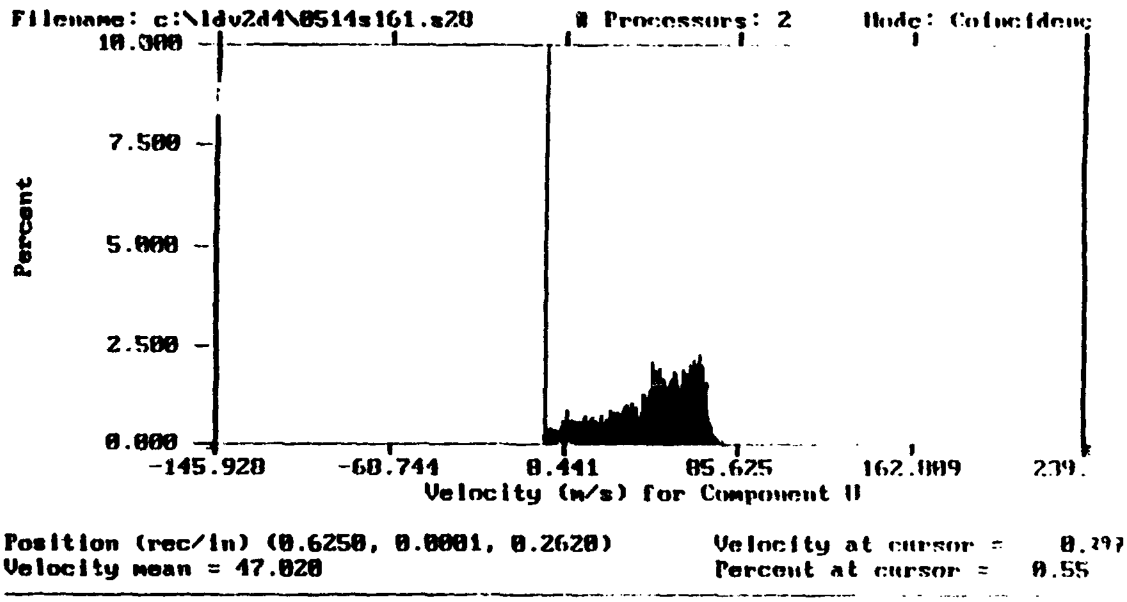
Position (rec/in) (0.6110, 0.0000, 0.0001) Velocity at cursor =
Velocity mean = 50.777 Percent at cursor = 0.33



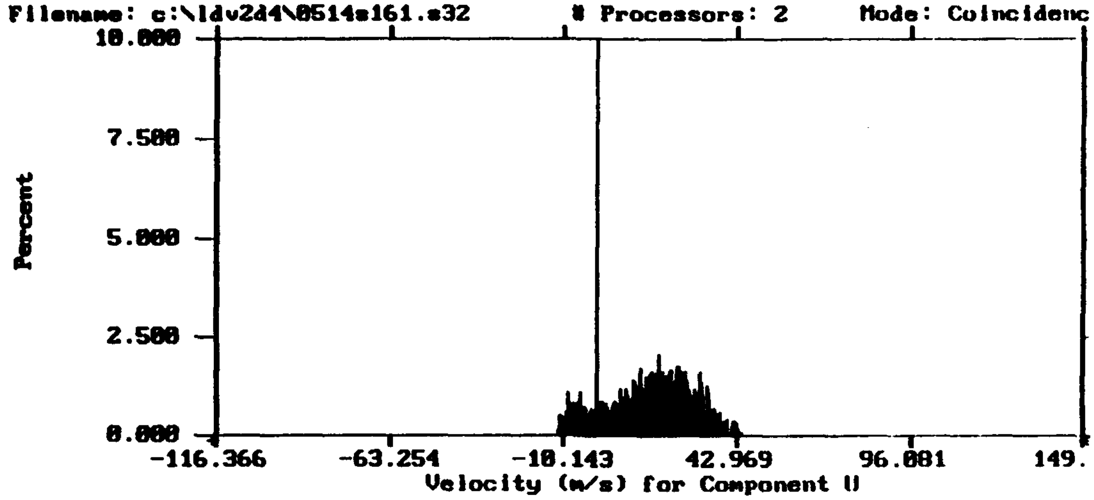
Position (rec/in) (0.6719, 0.0000, 0.0001) Velocity at cursor =
Velocity mean = 56.262 Percent at cursor = 0.00

C. HISTOGRAMS FROM STATION 16 THROUGH 19 FOR 50 DEG



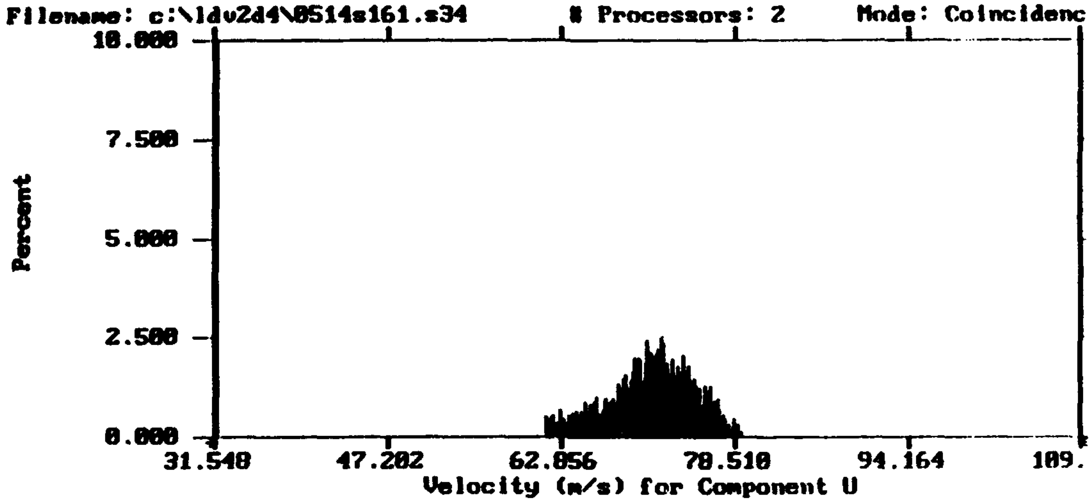


Filename: c:\ldv2d4\0514s161.s32 # Processors: 2 Mode: Coincidenc



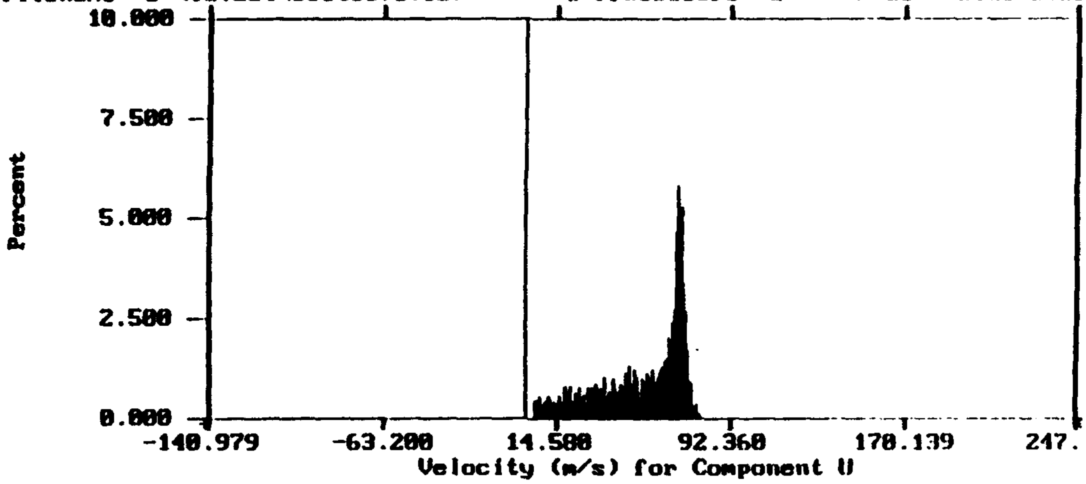
Position (rec/in) (0.1250, 0.0001, 0.2620) Velocity at cursor = -0.016
Velocity mean = 16.427 Percent at cursor = 0.68

Filename: c:\ldv2d4\0514s161.s34 # Processors: 2 Mode: Coincidenc



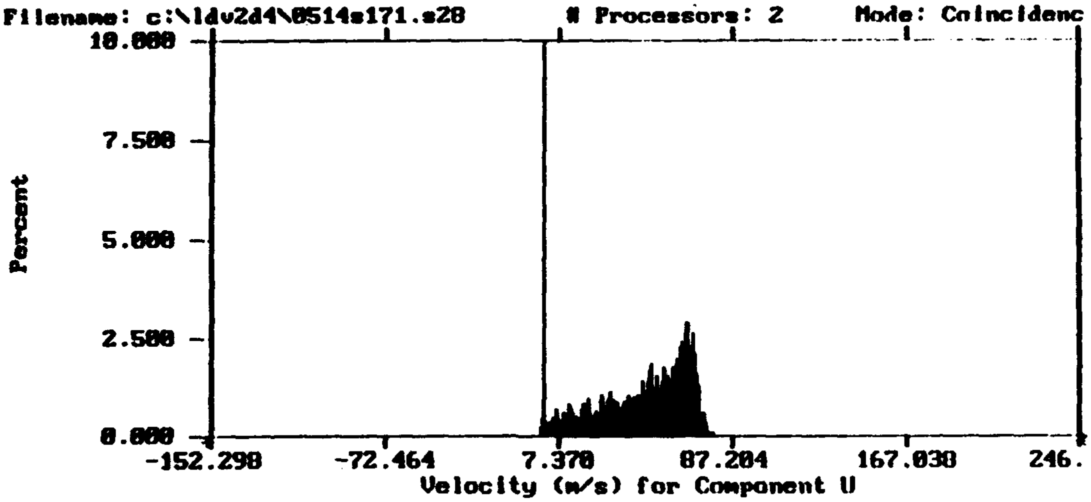
Position (rec/in) (-0.1250, 0.0001, 0.2620) Velocity at cursor = 31.548
Velocity mean = 70.683 Percent at cursor = 0.00

Filename: c:\ldv2d4\0514s171.s27 # Processors: 2 Mode: Coincidenc



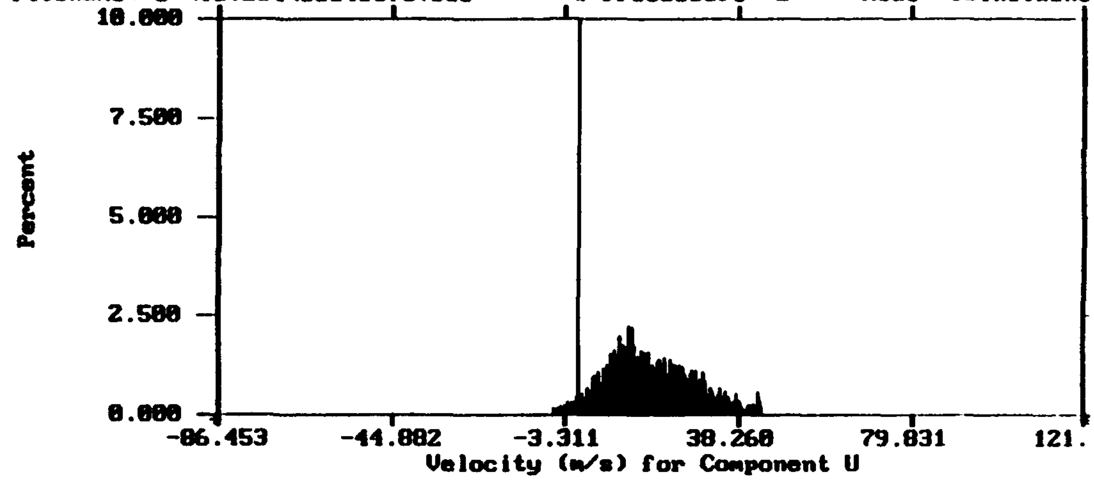
Position (rec/in) (0.7500, 0.0001, 0.3620) Velocity at cursor = 0.068
Velocity mean = 53.464 Percent at cursor = 0.00

Filename: c:\ldv2d4\0514s171.s28 # Processors: 2 Mode: Coincidenc



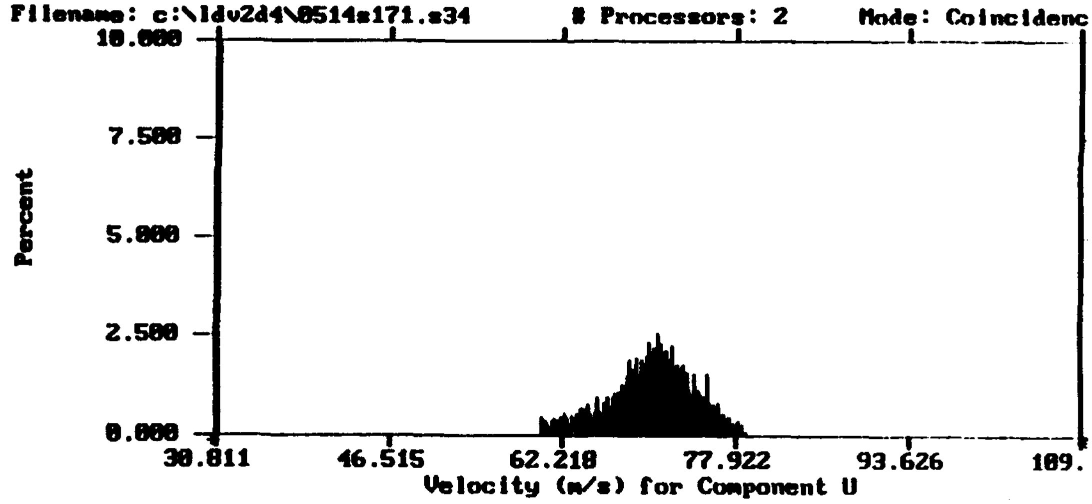
Position (rec/in) (0.6250, 0.0001, 0.3620) Velocity at cursor = 0.066
Velocity mean = 47.260 Percent at cursor = 0.42

Filename: c:\ldv2d4\0514s171.s33 # Processors: 2 Mode: Coincidenc



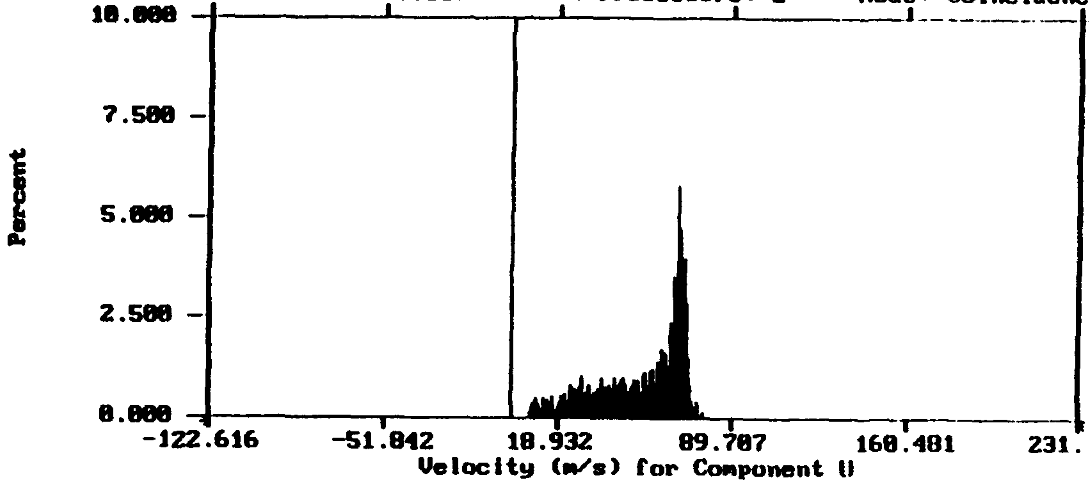
Position (rec/in) (-0.0001, 0.0001, 0.3620) Velocity at cursor = -0.174
Velocity mean = 17.474 Percent at cursor = 0.16

Filename: c:\ldv2d4\0514s171.s34 # Processors: 2 Mode: Coincidenc



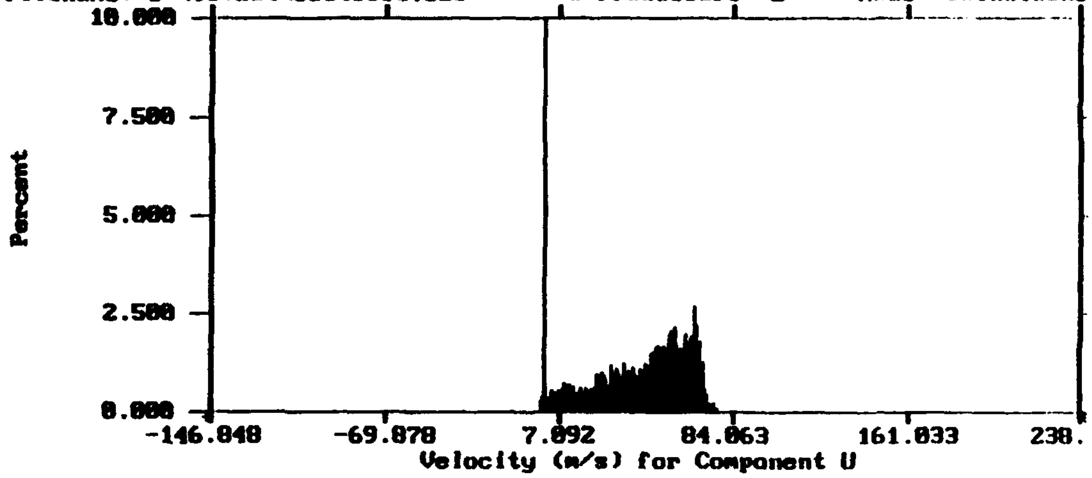
Position (rec/in) (-0.1250, 0.0001, 0.3620) Velocity at cursor = 30.811
Velocity mean = 70.070 Percent at cursor = 0.00

Filename: c:\ldv2d4\0514s101.s27 # Processors: 2 Mode: Coincidenc



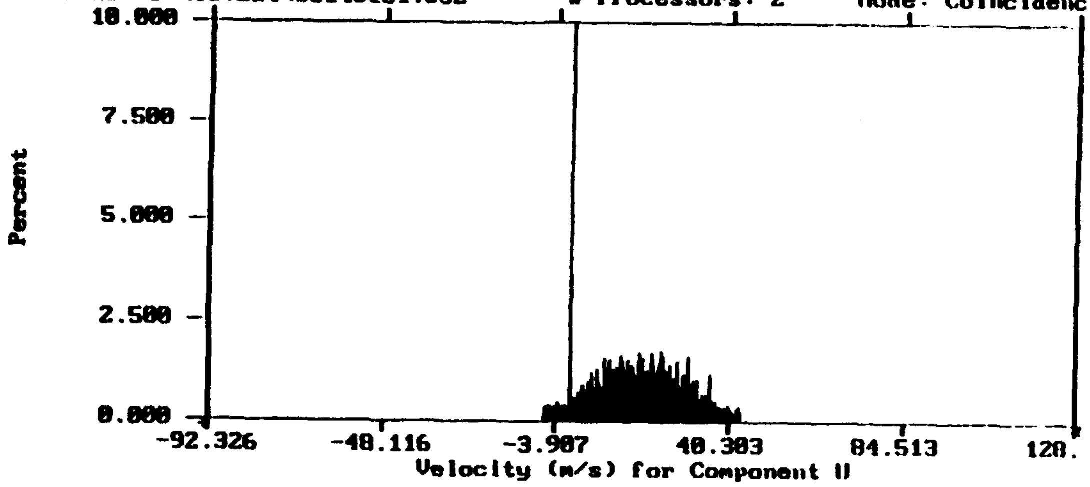
Position (rec/in) (0.7500, 0.0000, 0.6779) Velocity at cursor = -0.208
Velocity mean = 54.324 Percent at cursor = 0.00

Filename: c:\ldv2d4\0514s101.s20 # Processors: 2 Mode: Coincidenc



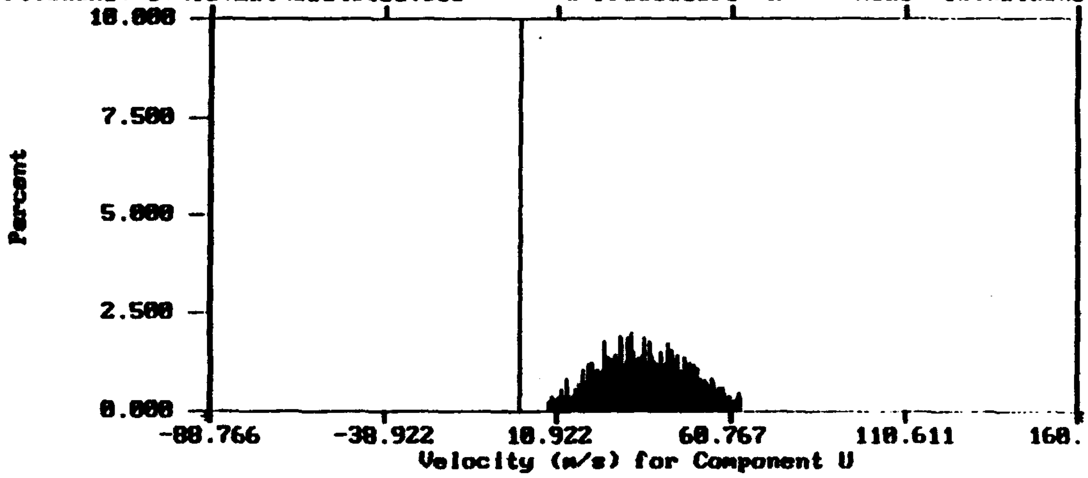
Position (rec/in) (0.6250, 0.0000, 0.6779) Velocity at cursor = -0.008
Velocity mean = 45.557 Percent at cursor = 0.23

Filename: c:\ldv2d4\0514s181.s32 # Processors: 2 Mode: Coincidenc



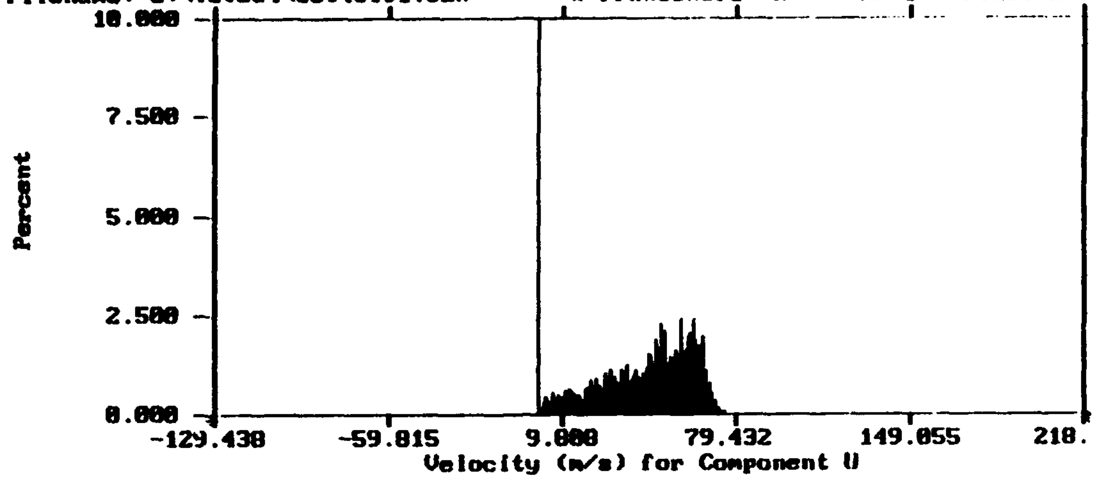
Position (rec/in) (0.1250, 0.0000, 0.6779) Velocity at cursor = -0.107
Velocity mean = 18.198 Percent at cursor = 0.49

Filename: c:\ldv2d4\0514s181.s33 # Processors: 2 Mode: Coincidenc



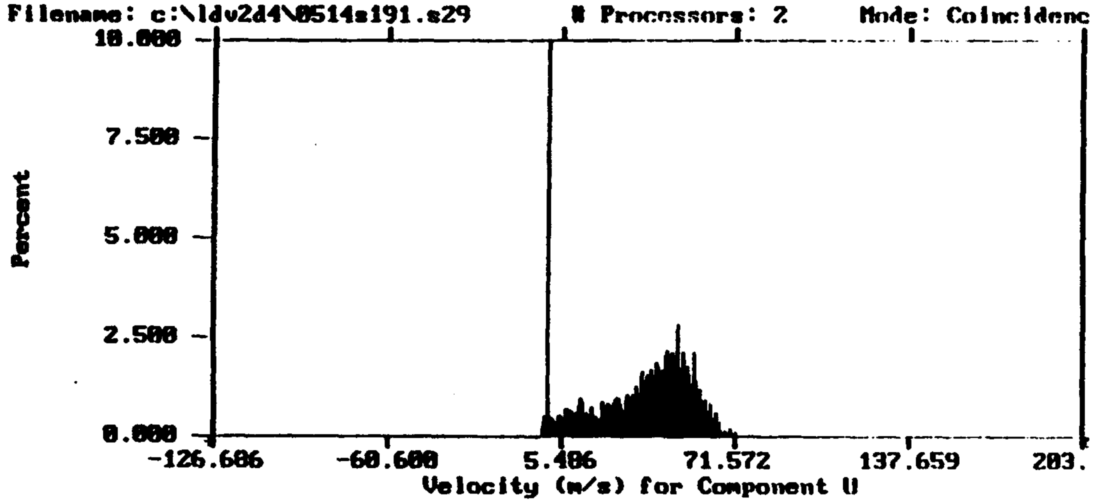
Position (rec/in) (-0.0001, 0.0000, 0.6779) Velocity at cursor = 0.055
Velocity mean = 35.053 Percent at cursor = 0.00

Filename: c:\ldv2d4\0514s191.s28 # Processors: 2 Mode: Coincidenc

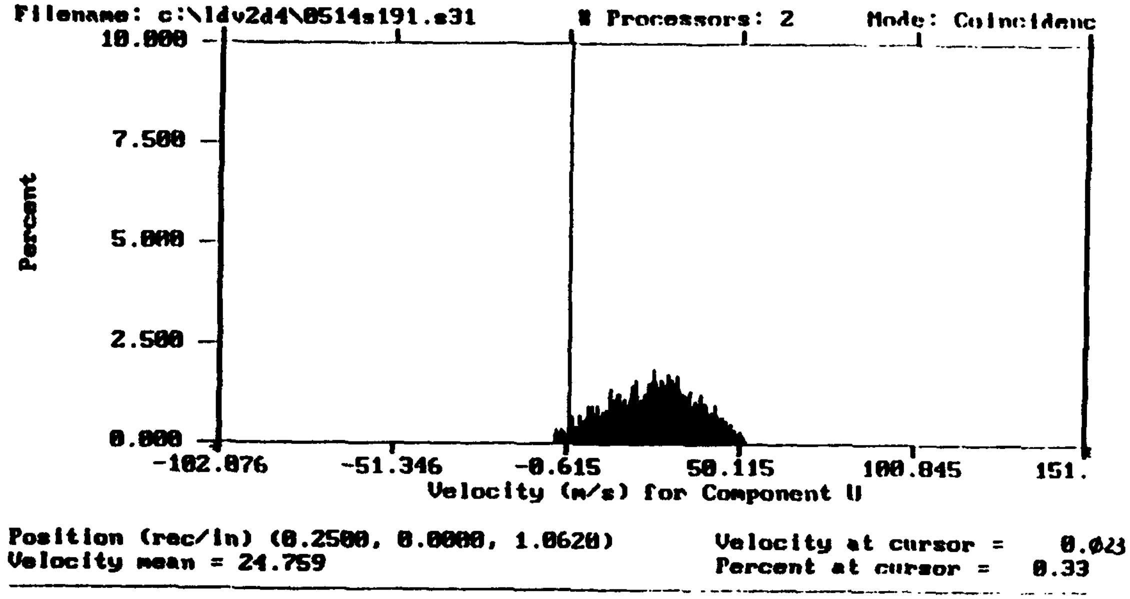


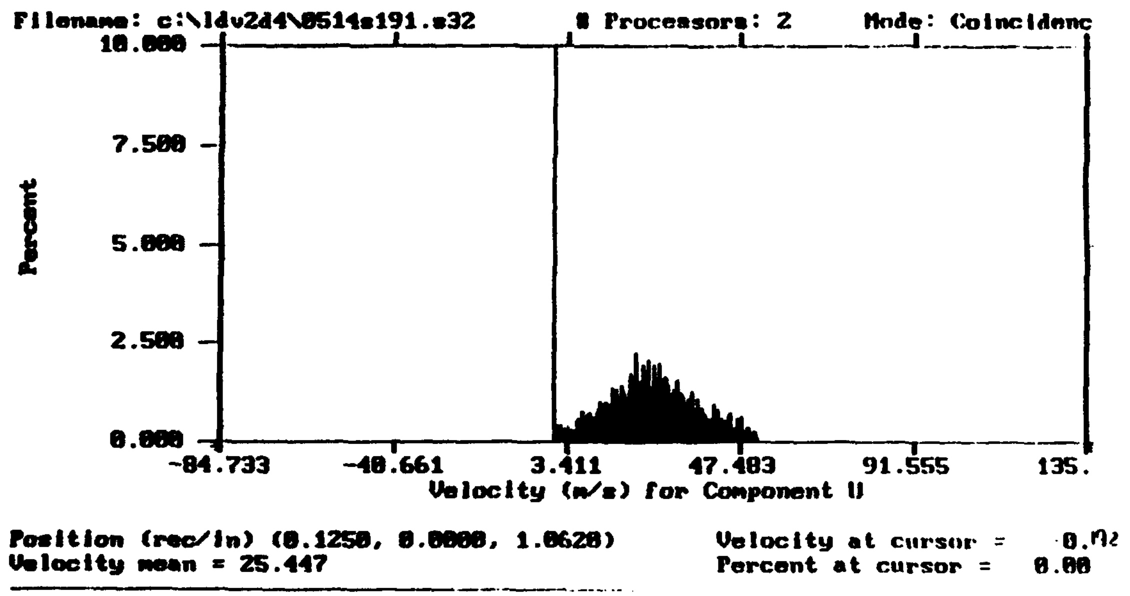
Position (rec/in) (0.6250, 0.0000, 1.0620) Velocity at cursor = -0.263
Velocity mean = 44.614 Percent at cursor = 0.00

Filename: c:\ldv2d4\0514s191.s29 # Processors: 2 Mode: Coincidenc



Position (rec/in) (0.4999, 0.0000, 1.0620) Velocity at cursor = 0.083
Velocity mean = 38.523 Percent at cursor = 0.29


Filename: c:\ldv2d4\0514s191.s31
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-102.076
-51.346
-0.615
50.115
100.845
151.
Velocity (m/s) for Component U
Position (rec/in) (0.2500, 0.0000, 1.0620)
Velocity mean = 24.759
Velocity at cursor = 0.023
Percent at cursor = 0.33


Filename: c:\ldv2d4\0514s191.s32
Processors: 2
Mode: Coincidenc
10.000
7.500
5.000
2.500
0.000
Percent
-84.733
-40.661
3.411
47.483
91.555
135.
Velocity (m/s) for Component U
Position (rec/in) (0.1250, 0.0000, 1.0620)
Velocity mean = 25.447
Velocity at cursor = 0.12
Percent at cursor = 0.00

D. TABLE OF SHIFT SELECTION AT PLUS OR MINUS 5MHZ AND LDV MEASUREMENTS.

BLUE BEAM (NORMAL FLOW), FRINGES DIRECTION → FLOW DIRECTION →

SHIFT	FIND SOFTWARE	VELOCITY M/S	FREQUENCY MHZ
0	0	-	-
UP 5	0	22.832	5.128
DOWN 5	0	21.501	4.702
UP 5	**+ 5**	**0.492**	**5.213**
DOWN 5	+ 5	-1.689	4.639
UP 5	- 5	45.031	5.063
DOWN 5	- 5	44.823	4.889

BLUE BEAM (REVERSE FLOW), FRINGES DIRECTION → FLOW DIRECTION ←

SHIFT	FIND SOFTWARE	VELOCITY M/S	FREQUENCY MHZ
0	0	-	-
UP 5	0	20.597	4.622
DOWN 5	0	24.232	5.422
UP 5	**+ 5**	**-2.253**	**4.543**
DOWN 5	+ 5	1.710	5.363
UP 5	- 5	43.005	4.576
DOWN 5	- 5	46.660	5.347

This two tables shows that with the shifter at UP 5MHz and FIND software at +5 it is possible to measured a positive and negative velocity (normal and reverse flow).

GREEN BEAN (NORMAL FLOW), FRINGES DIRECTION ↓ FLOW DIRECTIONS ↑

SHIFT	FIND SOFTWARE	VELOCITY M/S	FREQUENCY MHZ
0	0	2.389	0.481
UP 5	0	21.795	4.549
DOWN 5	0	25.433	5.284
UP 5	+ 5	-2.116	4.682
DOWN 5	**+ 5**	**1.724**	**5.350**
UP 5	- 5	45.805	4.401
DOWN 5	- 5	49.137	5.392

GREEN BEAN (REVERSE FLOW), FRINGES DIRECTION ↓ FLOW DIRECTIONS ↓

SHIFT	FIND SOFTWARE	VELOCITY M/S	FREQUENCY MHZ
0	0	6.077	1.282
UP 5	0	29.226	6.136
DOWN 5	0	17.658	3.725
UP 5	+ 5	5.025	6.185
DOWN 5	**+ 5**	**-6.355**	**3.672**
UP 5	- 5	53.047	6.185
DOWN 5	- 5	41.470	3.757

This two tables shows that with the shifter at DOWN 5MHz and FIND software at +5 it is possible to measured a positive and negative velocity (normal and reverse flow).

E. TUNNEL CALIBRATION DATA

```
cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
c                                                                      c
c                    OUTPUT FROM PROGRAM CALIBRATE                     c
c                                                                      c
cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
```

LEAST SQUARES STRAIGHT LINE CURVE FIT IS USED
TO DETERMINE TUNNEL CHARACTERISTICS AT DIFFERENT SPEEDS

NEWTON S METHOD IS USED TO DETERMINE THE REFERENCE VELOCITY
FROM THE RECORDED AMBIENT PRESSURE AND TUNNEL PLENUM
PRESSURE AND TEMPERATURE

BEGIN DETERMINING TUNNEL CHARACTERISTICS
FROM THE FOLLOWING MEASURED VALUES

AXIAL VEL. M PER SEC	TANGENTIAL VEL. M PER SEC.	AMBIENT PRESS. INCHES MERCURY	PLENUM PRESS. INCHES WATER	PLENUM TEMP. DEG. C.
19.9600	24.6660	29.8941	2.0000	17.7778
32.0520	39.2970	29.8941	4.7000	18.0556
39.7110	48.1900	29.8941	7.3000	18.8889
46.6360	55.9700	29.9841	10.0000	19.4444
50.9830	61.5980	29.9841	12.0000	20.0000
54.9530	66.2070	29.9841	14.1000	20.5556

CALCULATED VALUES FOR THE TUNNEL CONFIGURATION

TOTAL VALOCITY	MACH NUMBER	MACH NUMBER FUNCT.	PRESSURE RATIO
0.317303192E+02	0.414931434E-01	0.599998018E-02	-0.193311650E+03
0.507107968E+02	0.662819212E-01	0.152081979E-01	-0.816858085E+02
0.624438918E+02	0.815012269E-01	0.228644274E-01	-0.522360685E+02
0.728529848E+02	0.949967822E-01	0.308775796E-01	-0.379793300E+02
0.799598643E+02	0.104164963E+00	0.369544196E-01	-0.314827750E+02
0.860418448E+02	0.111981989E+00	0.425268503E-01	-0.266449149E+02

CALLING LEAST SQUARES SUBROUTINE
TO DETERMINE THE PRESSURE RATIO AS A FUNCTION OF MACH NO. PARAM

PRESSURE RATIO = A1 * ANUX + A0

MATRIX EQUATION

```
 0.60E+01   -0.42E+03 A0     0.15E+00
-0.42E+03    0.50E+05 A1    -0.71E+01

  A1 =    0.19109469172E-03   A0 =    0.39221597704E-01
```

REFERENCE CONDITIONS FOR EACH RUN

AMBIENT PRESSURE INCHES MERCURY	PLENUM PRESSURE INCHES WATER	PLENUM TEMPERATURE DEGREES CELSIUS	RUN NAME

29.8737	12.0000	18.8889	0514s11.PRN
29.8737	12.0000	20.0000	0514s1a1.PRN
29.8684	12.0000	22.7778	0514s1b1.PRN
29.8481	12.0000	22.2222	0514s1c1.PRN
29.8481	12.0000	22.7778	0514s1d1.PRN
29.8481	12.0000	22.7778	0514s1e1.PRN
30.0110	12.1000	21.1111	0511s21.PRN
30.0110	12.1000	21.1111	0511s2a1.PRN
30.0110	12.1000	22.2222	0511s2b1.PRN
29.9702	12.2000	20.5556	0512s31.PRN
29.9906	12.2000	21.1111	0512s41.PRN
29.9906	12.1000	21.1111	0512s51.PRN
29.9906	12.1000	21.1111	0512s61.PRN
29.9092	12.1000	22.2222	0507s71.PRN
29.9295	12.2000	22.7778	0508s81.PRN
29.9295	12.2000	22.7778	0507s91.PRN
29.9295	12.2000	22.7778	0507s101.PRN
29.9295	12.2000	23.3333	0507s111.PRN
29.9499	12.2000	23.3333	0507s121.PRN
29.9499	12.2000	23.3333	0507s131.PRN
30.0110	12.0000	21.1111	0508s141.PRN
29.9906	12.0000	21.6667	0508s151.PRN
29.8684	12.0000	21.6667	0514s161.PRN
29.8684	12.0000	22.2222	0514s171.PRN
29.8684	12.0000	22.2222	0514s181.PRN
29.8684	12.0000	22.2222	0514s191.PRN

```
I =   1
PRESSURE RATIO =  -31.36317 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s11.PRN


        BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.104363    ERROR TERM =  -0.6401E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110764    ERROR TERM =   0.1655E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.5999E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.1731E-10

VREF =        84.73722268314


I =   2
PRESSURE RATIO =  -31.36317 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s1a1.PRN


        BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.104165    ERROR TERM =  -0.6610E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110775    ERROR TERM =   0.1765E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.7161E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2066E-10

VREF =        84.89826103496


I =   3
```

```
PRESSURE RATIO =  -31.35743 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s1b1.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103675    ERROR TERM =  -0.7129E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110804    ERROR TERM =   0.2053E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.1066E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.3074E-10

VREF =        85.29953401308

I =   4
PRESSURE RATIO =  -31.33544 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s1c1.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103772    ERROR TERM =  -0.7025E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110798    ERROR TERM =   0.1994E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.9887E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2852E-10

VREF =        85.21942480550

I =   5
PRESSURE RATIO =  -31.33544 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s1d1.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103675    ERROR TERM =  -0.7129E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110804    ERROR TERM =   0.2053E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.1066E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.3074E-10

VREF =        85.29953401308

I =   6
PRESSURE RATIO =  -31.33544 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s1e1.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103675    ERROR TERM =  -0.7129E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110804    ERROR TERM =   0.2053E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.1066E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.3074E-10
```

```
VREF =        85.29953401308


I =    7
PRESSURE RATIO =  -31.24322 MACH NUMBER PARAMETER =   0.4153E-01
RUN NAME =    0511s21.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103968    ERROR TERM =  -0.6846E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110814    ERROR TERM =   0.1893E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110625    ERROR TERM =   0.8621E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110625    ERROR TERM =  -0.2489E-10

VREF =        85.07919440271


I =    8
PRESSURE RATIO =  -31.24322 MACH NUMBER PARAMETER =   0.4153E-01
RUN NAME =    0511s2a1.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103968    ERROR TERM =  -0.6846E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110814    ERROR TERM =   0.1893E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110625    ERROR TERM =   0.8621E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110625    ERROR TERM =  -0.2489E-10

VREF =        85.07919440271


I =    9
PRESSURE RATIO =  -31.24322 MACH NUMBER PARAMETER =   0.4153E-01
RUN NAME =    0511s2b1.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103772    ERROR TERM =  -0.7053E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110826    ERROR TERM =   0.2009E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110625    ERROR TERM =   0.1007E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110625    ERROR TERM =  -0.2908E-10

VREF =        85.23966280667


I =   10
PRESSURE RATIO =  -30.93546 MACH NUMBER PARAMETER =   0.4155E-01
RUN NAME =    0512s31.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.104066    ERROR TERM =  -0.6770E-02
```

```
ITERATION NUMBER  2   MACH NO. PARAM. = 0.110836    ERROR TERM =   0.1850E-03
ITERATION NUMBER  3   MACH NO. PARAM. = 0.110651    ERROR TERM =   0.8108E-07
ITERATION NUMBER  4   MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.2344E-10

VREF =        85.01903047416


I =  11
PRESSURE RATIO =  -30.95720 MACH NUMBER PARAMETER =    0.4155E-01
RUN NAME =    0512s41.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1   MACH NO. PARAM. = 0.103968    ERROR TERM =  -0.6874E-02
ITERATION NUMBER  2   MACH NO. PARAM. = 0.110842    ERROR TERM =   0.1908E-03
ITERATION NUMBER  3   MACH NO. PARAM. = 0.110651    ERROR TERM =   0.8790E-07
ITERATION NUMBER  4   MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.2540E-10

VREF =        85.09939011711


I =  12
PRESSURE RATIO =  -31.22131 MACH NUMBER PARAMETER =    0.4153E-01
RUN NAME =    0512s51.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1   MACH NO. PARAM. = 0.103968    ERROR TERM =  -0.6846E-02
ITERATION NUMBER  2   MACH NO. PARAM. = 0.110814    ERROR TERM =   0.1893E-03
ITERATION NUMBER  3   MACH NO. PARAM. = 0.110625    ERROR TERM =   0.8621E-07
ITERATION NUMBER  4   MACH NO. PARAM. = 0.110625    ERROR TERM =  -0.2489E-10

VREF =        85.07919440271


I =  13
PRESSURE RATIO =  -31.22131 MACH NUMBER PARAMETER =    0.4153E-01
RUN NAME =    0512s61.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1   MACH NO. PARAM. = 0.103968    ERROR TERM =  -0.6846E-02
ITERATION NUMBER  2   MACH NO. PARAM. = 0.110814    ERROR TERM =   0.1893E-03
ITERATION NUMBER  3   MACH NO. PARAM. = 0.110625    ERROR TERM =   0.8621E-07
ITERATION NUMBER  4   MACH NO. PARAM. = 0.110625    ERROR TERM =  -0.2489E-10

VREF =        85.07919440271


I =  14
PRESSURE RATIO =  -31.13385 MACH NUMBER PARAMETER =    0.4153E-01
RUN NAME =    0507s71.PRN
```

```
        BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103772    ERROR TERM =  -0.7053E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110826    ERROR TERM =   0.2009E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110625    ERROR TERM =   0.1007E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110625    ERROR TERM =  -0.2908E-10

VREF =       85.23966280667


I =  15
PRESSURE RATIO =  -30.89209 MACH NUMBER PARAMETER =   0.4155E-01
RUN NAME =   0508s81.PRN


        BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103675    ERROR TERM =  -0.7184E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110859    ERROR TERM =   0.2084E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110651    ERROR TERM =   0.1105E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.3193E-10

VREF =       85.34004386482


I =  16
PRESSURE RATIO =  -30.89209 MACH NUMBER PARAMETER =   0.4155E-01
RUN NAME =   0507s91.PRN


        BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103675    ERROR TERM =  -0.7184E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110859    ERROR TERM =   0.2084E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110651    ERROR TERM =   0.1105E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.3193E-10

VREF =       85.34004386482


I =  17
PRESSURE RATIO =  -30.89209 MACH NUMBER PARAMETER =   0.4155E-01
RUN NAME =   0507s101.PRN


        BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103675    ERROR TERM =  -0.7184E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110859    ERROR TERM =   0.2084E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110651    ERROR TERM =   0.1105E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.3193E-10

VREF =       85.34004386482


I =  18
```

```
PRESSURE RATIO =  -30.89209 MACH NUMBER PARAMETER =   0.4155E-01
RUN NAME =    0507s111.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103578    ERROR TERM =  -0.7288E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110865    ERROR TERM =   0.2145E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110651    ERROR TERM =   0.1188E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.3432E-10

VREF =          85.42010151240


I =   19
PRESSURE RATIO =  -30.91383 MACH NUMBER PARAMETER =   0.4155E-01
RUN NAME =    0507s121.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103578    ERROR TERM =  -0.7288E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110865    ERROR TERM =   0.2145E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110651    ERROR TERM =   0.1188E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.3432E-10

VREF =          85.42010151240


I =   20
PRESSURE RATIO =  -30.91383 MACH NUMBER PARAMETER =   0.4155E-01
RUN NAME =    0507s131.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103578    ERROR TERM =  -0.7288E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110865    ERROR TERM =   0.2145E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110651    ERROR TERM =   0.1188E-06
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110651    ERROR TERM =  -0.3432E-10

VREF =          85.42010151240


I =   21
PRESSURE RATIO =  -31.51192 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =    0508s141.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103968    ERROR TERM =  -0.6818E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110786    ERROR TERM =   0.1878E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.8454E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2439E-10
```

```
VREF =        85.05899450070


I =  22
PRESSURE RATIO =  -31.48982 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0508s151.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103870    ERROR TERM =  -0.6922E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110792    ERROR TERM =   0.1936E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.9153E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2640E-10

VREF =        85.13925466046


I =  23
PRESSURE RATIO =  -31.35743 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s161.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103870    ERROR TERM =  -0.6922E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110792    ERROR TERM =   0.1936E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.9153E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2640E-10

VREF =        85.13925466046


I =  24
PRESSURE RATIO =  -31.35743 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s171.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103772    ERROR TERM =  -0.7025E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110798    ERROR TERM =   0.1994E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.9887E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2852E-10

VREF =        85.21942480550


I =  25
PRESSURE RATIO =  -31.35743 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s181.PRN


         BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103772    ERROR TERM =  -0.7025E-02
```

```
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110798    ERROR TERM =   0.1994E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.9887E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2852E-10

VREF =       85.21942480550


I =  26
PRESSURE RATIO =  -31.35743 MACH NUMBER PARAMETER =   0.4151E-01
RUN NAME =   0514s191.PRN


          BEGIN NEWTON ITERATION

ITERATION NUMBER  1  MACH NO. PARAM. = 0.103772    ERROR TERM =  -0.7025E-02
ITERATION NUMBER  2  MACH NO. PARAM. = 0.110798    ERROR TERM =   0.1994E-03
ITERATION NUMBER  3  MACH NO. PARAM. = 0.110598    ERROR TERM =   0.9887E-07
ITERATION NUMBER  4  MACH NO. PARAM. = 0.110598    ERROR TERM =  -0.2852E-10

VREF =       85.21942480550
```

EXPERIMENT NUMBER	REFERENCE VELOCITY	NAME
1	84.7372	0514s11.PRN
2	84.8983	0514s1a1.PRN
3	85.2995	0514s1b1.PRN
4	85.2194	0514s1c1.PRN
5	85.2995	0514s1d1.PRN
6	85.2995	0514s1e1.PRN
7	85.0792	0511s21.PRN
8	85.0792	0511s2a1.PRN
9	85.2397	0511s2b1.PRN
10	85.0190	0512s31.PRN
11	85.0994	0512s41.PRN
12	85.0792	0512s51.PRN
13	85.0792	0512s61.PRN
14	85.2397	0507s71.PRN
15	85.3400	0508s81.PRN
16	85.3400	0507s91.PRN
17	85.3400	0507s101.PRN
18	85.4201	0507s111.PRN
19	85.4201	0507s121.PRN
20	85.4201	0507s131.PRN
21	85.0590	0508s141.PRN
22	85.1393	0508s151.PRN
23	85.1393	0514s161.PRN
24	85.2194	0514s171.PRN
25	85.2194	0514s181.PRN
26	85.2194	0514s191.PRN

F. SURVEYS FROM STATION 1 THROUGH 19

Pitchwise Survey at Station 1

X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle Mean	UV-Reyn. Stress	UV-Correl. Coeff.
2	-6.29	0.520433	0.59714	26.66733	3.767986	0.79304	41.1	0.104	0.00149
1.75	-6.29	0.723413	0.598801	5.89988	3.620993	0.938375	50.4	0.303	0.0199
1.5	-6.29	0.718693	0.598801	6.964131	3.682949	0.938835	50.2	-0.00799	-0.00044
1.25	-6.29	0.728134	0.59632	4.820244	3.88615	0.941735	50.6	0.00456	0.000341
1	-6.29	0.682109	0.608842	13.02828	3.550129	0.914692	48.2	0.702	0.0212
0.75	-6.29	0.718693	0.611302	6.331862	3.551693	0.942915	49.6	-0.186	-0.0115
0.5	-6.29	0.713972	0.613862	8.353474	3.708519	0.940555	49.3	0.0727	0.00329
0.25	-6.29	0.728953	0.611302	6.302886	3.849088	0.949896	50	-0.324	-0.0186
-0.0001	-6.29	0.738755	0.617202	4.137026	3.746418	0.961797	50.1	-0.172	-0.0155
-0.25	-6.29	0.743475	0.613862	4.379088	3.758811	0.962977	50.5	-0.529	-0.0449
-0.5	-6.29	0.744865	0.611302	5.242373	3.741167	0.962977	50.6	0.0606	0.0036
-0.75	-6.29	0.743475	0.611302	5.406064	3.612793	0.961797	50.6	-0.0639	-0.00466
-1	-6.29	0.734034	0.606401	7.08811	3.638461	0.951176	50.5	-0.0384	-0.00207
-1.25	-6.29	0.734034	0.59596	6.661603	3.946257	0.946276	50.9	-0.746	-0.0303
-1.5	-6.29	0.738394	0.59596	6.178349	3.563842	0.947636	51	-0.462	-0.0292
-1.75	-6.29	0.732854	0.59632	5.870161	3.470289	0.946456	50.8	-0.622	-0.0425
-2	-6.29	0.710432	0.603041	9.875002	3.578033	0.932294	49.6	-0.129	-0.00511
-2.25	-6.29	0.721053	0.607761	6.990423	3.46855	0.942915	49.6	0.186	0.0114
-2.5	-6.29	0.732854	0.613862	3.979397	3.620806	0.955897	50.1	-0.755	-0.073
-2.75	-6.29	0.738394	0.613862	3.807159	3.589923	0.958257	50.2	-0.536	-0.0547
-3	-6.29	0.737575	0.614842	3.636242	3.496155	0.960617	50.2	-0.544	-0.0886
-3.25	-6.29	0.743475	0.619583	3.672787	3.364225	0.967898	50.2	-0.233	-0.0283
-3.5	-6.29	0.743475	0.613862	3.667896	3.516283	0.964157	50.4	-0.134	-0.0146
-3.75	-6.29	0.745836	0.611302	3.505426	3.489968	0.964157	50.7	-0.189	-0.0215
-4	-6.29	0.750556	0.600681	3.542624	3.399853	0.960817	51.3	-0.312	-0.0382

Pitchwise Survey at Station 1A

X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle Mean	UV-Reyn. Stress	UV-Correl. Coeff.
2	-5.5	0.785622	0.564204	8.72809	6.26287	0.951727	53.6	2.87	0.0726
1.75	-5.5	0.751487	0.554781	6.304979	5.209398	0.934059	53.6	0.0688	0.0029
1.5	-5.5	0.707908	0.557137	8.140917	4.652098	0.901078	51.9	0.179	0.00655
1.25	-5.5	0.696127	0.570094	5.388023	4.851499	0.8999	50.7	0.0564	0.00299
1	-5.5	0.667858	0.587762	8.214652	4.813771	0.890477	48.6	-0.262	-0.00922
0.75	-5.5	0.459373	0.606808	23.61178	5.034848	0.76091	37.1	-0.551	-0.00643
0.5	-5.5	0.580695	0.617209	21.60185	5.419096	0.846896	43.3	2.07	0.0245
0.25	-5.5	0.499421	0.633699	24.37175	5.468826	0.808026	38.2	4.84	0.0503
-0.0001	-5.5	0.592474	0.633699	22.57324	5.69062	0.868097	43.1	1.27	0.0137
-0.25	-5.5	0.738531	0.628986	7.828425	6.289679	0.969395	49.6	-1.74	-0.0489
-0.5	-5.5	0.76091	0.614853	7.160167	6.271504	0.97764	51.1	-0.153	-0.00474
-0.75	-5.5	0.762088	0.596007	6.523476	6.317677	0.967039	52	1.33	0.045
-1	-5.5	0.765622	0.578339	5.497165	5.471067	0.958794	52.9	2.8	0.129
-1.25	-5.5	0.74442	0.552426	6.729568	5.198326	0.926991	53.4	0.818	0.0324
-1.5	-5.5	0.713795	0.580671	7.009469	4.933903	0.908868	51.9	-0.973	-0.0391
-1.75	-5.5	0.702016	0.578339	5.075579	4.719246	0.909323	50.5	-0.742	-0.0429
-2	-5.5	0.702016	0.598363	5.033458	4.553542	0.92228	49.6	-0.981	-0.0594
-2.25	-5.5	0.702016	0.616031	5.005377	4.786562	0.934059	48.7	-1.29	-0.0747
-2.5	-5.5	0.706728	0.623098	5.088441	5.321261	0.942304	48.6	-2.16	-0.111
-2.75	-5.5	0.710262	0.641945	6.278712	4.923715	0.957616	47.9	-0.93	-0.0417
-3	-5.5	0.734997	0.634877	5.740327	5.555176	0.971751	49.2	-0.98	-0.0426

	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 1B									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn	UV-Correl
6								Mean	Stress	Coeff
7	2	-5	0.790157	0.477567	4.748844	8.922561	0.922631	58.9	8.4	[illegible]
8	1.75	-5	0.752642	0.398185	7.195259	6.0719	0.853463	61.9	7.5	[illegible]
9	1.5	-5	0.624857	0.461383	5.648708	5.785731	0.779806	53.2	-1.11	-0.0466
10	1.25	-5	0.599066	0.542356	4.157516	4.538632	0.812431	47.6	1.19	0.0865
11	1	-5	0.6061	0.593129	4.291186	4.325254	0.852291	45.4	1.69	0.125
12	0.75		0.62134	0.623505	4.9146	5.502236	0.883944	44.6	0.847	0.0421
13	0.5	-5	0.662372	0.647552	6.100446	6.242616	0.929665	45.4	-3.08	0.112
14	0.25	-5	0.688163	0.65213	6.571961	7.274251	0.949595	46.4	5.98	0.173
15	-0.0001	-5	0.726851	0.686359	6.62161	8.486568	0.98711	47.4	6.35	0.155
16	-0.25	-5	0.745606	0.645243	6.196003	9.624793	0.985938	49.1	-9.54	0.22
17	-0.5	-5	0.765538	0.654624	4.891787	10.37286	1.008212	49.3	1.66	0.045
18	-0.75	-5	0.798363	0.612245	4.446884	10.77052	1.005868	52.5	7.99	[illegible]
19	-1	-5	0.800708	0.503191	4.668128	9.052808	0.944906	57.8	10.8	0.251
20	-1.25	-5	0.747953	0.420004	7.098072	6.111173	0.859325	60.4	7.1	0.223
21	-1.5	-5	0.643615	0.481474	5.56083	5.532975	0.805397	53	1.37	0.0683
22	-1.75	-5	0.614306	0.554627	4.711728	4.97616	0.831189	47.6	1.13	0.0662
23	-2	-5	0.617823	0.593764	5.010545	5.567407	0.858153	46	0.198	0.00975

1										
2	Pitchwise Survey at Station 1C									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	2	-4.9	0.809675	0.451775	4.064567	7.951241	0.927019	60.9	4.47	0.191
8	1.75	-4.9	0.751003	0.282187	8.110829	4.967179	0.806154	68.8	4.26	0.146
9	1.5	-4.9	0.585547	0.456295	5.00643	4.96272	0.741615	52.1	-0.273	-0.0151
10	1.25	-4.9	0.574986	0.547997	4.312398	4.963895	0.79442	46.4	1.74	0.112
11	1	-4.9	0.583201	0.594935	4.461484	5.473402	0.833144	44.4	0.453	0.0256
12	0.75	-4.9	0.597282	0.631312	4.234728	5.725997	0.86952	43.4	-0.16	-0.00911
13	0.5	-4.9	0.68529	0.64774	6.969958	7.080364	0.942274	46.6	-5.58	-0.157
14	0.25	-4.9	0.704065	0.662995	6.878715	7.491839	0.966916	46.7	-5.81	-0.155
15	-0.0001	-4.9	0.724014	0.68177	6.92157	8.726851	0.993905	46.7	-5.99	-0.137
16	-0.25	-4.9	0.742789	0.692331	6.217141	10.24649	1.016201	47	-8.1	-0.174
17	-0.5	-4.9	0.768604	0.66661	4.980556	11.22781	1.032629	48.1	0.427	0.0106
18	-0.75	-4.9	0.79794	0.641873	4.667951	12.19558	1.024415	51.2	11.3	0.272
19	-1	-4.9	0.807328	0.468203	3.675174	8.006276	0.93406	59.9	5.61	0.248
20	-1.25	-4.9	0.749629	0.319176	7.498293	5.872841	0.814369	66.9	8.1	0.253
21	-1.5	-4.9	0.600802	0.451775	5.58746	6.053786	0.752176	53.1	-0.165	0.00675
22	-1.75	-4.9	0.611363	0.543304	5.355541	5.487366	0.817889	48.4	-0.0217	-0.00101
23	-2	-4.9	0.614883	0.597282	5.294147	6.032547	0.857786	45.9	-0.823	-0.0356

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 1D									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	2	-4.844	0.778157	0.456255	14.59978	8.567149	0.902052	59.6157	-22.0161	-0.2422
8	1.875	-4.844	0.757237	0.326391	17.95953	5.800558	0.824584	66.6825	-25.2127	-0.33263
9	1.75	-4.844	0.730422	0.109907	9.603218	5.875302	0.738644	81.4429	-8.77056	-0.21364
10	1.625	-4.844	0.557247	0.334954	5.917017	5.777084	0.650168	58.9904	-5.34166	-0.21477
11	1.5	-4.844	0.548677	0.43947	4.818682	5.652643	0.702981	51.3065	-0.28305	-0.01428
12	1.375	-4.8441	0.550137	0.508439	4.510985	4.914687	0.747751	47.3683	0.990964	0.061432
13	1.25	-4.844	0.553921	0.542199	4.604963	5.067545	0.775118	45.6127	0.378153	0.022316
14	1.1249	-4.844	0.570131	0.563918	5.431109	5.528106	0.801906	45.3139	0.058593	0.002883
15	1	-4.844	0.582335	0.593108	5.562041	5.599264	0.831198	44.475	-0.42142	-0.0186
16	0.875	-4.844	0.594252	0.611184	5.944541	5.854637	0.852456	44.1953	-2.99451	-0.11825
17	0.75	-4.844	0.619621	0.625818	6.525729	6.173211	0.88067	44.7149	-1.12419	-0.03835
18	0.625	-4.844	0.630949	0.642045	6.828504	6.531586	0.900176	44.5006	-2.66725	-0.08219
19	0.4999	-4.844	0.644833	0.654979	6.997788	6.937933	0.919134	44.5528	-4.0235	-0.1139
20	0.3749	-4.844	0.662465	0.663159	7.629605	7.339177	0.937358	44.97	-6.16138	-0.15123
21	0.25	-4.844	0.674158	0.673546	7.476677	7.910793	0.95297	45.026	-9.56082	-0.22216
22	0.125	-4.844	0.686955	0.679438	7.571753	8.301234	0.9662	45.3152	-9.9735	-0.21808
23	-0.0001	-4.844	0.706899	0.680707	8.004001	9.095476	0.981361	46.0813	-9.77831	-0.1846
24	-0.125	-4.844	0.71167	0.700438	7.845237	9.080234	0.998543	45.4558	-10.1554	-0.19836
25	-0.2501	-4.844	0.730038	0.688952	7.916754	10.59898	1.003798	46.6585	-11.3925	-0.18864
26	-0.3751	-4.844	0.73746	0.695425	7.568629	10.62025	1.013639	46.6804	-3.91207	-0.06689
27	-0.5	-4.844	0.754004	0.69726	7.724172	11.69583	1.026983	47.2392	-0.42649	-0.00649
28	-0.625	-4.844	0.769749	0.688993	7.788551	12.39093	1.033066	48.1686	7.71674	0.109895
29	-0.75	-4.844	0.784465	0.653604	8.743651	12.84267	1.02107	50.1995	7.07677	0.088815
30	-0.875	-4.844	0.786061	0.573416	11.91511	11.97058	0.972983	53.89	-7.16541	-0.06905
31	-1	-4.844	0.778046	0.447591	14.34133	8.280391	0.897603	60.0892	-17.6641	-0.20444
32	-1.125	-4.844	0.76034	0.320533	17.12931	5.743566	0.825141	67.1414	-18.9382	-0.26456
33	-1.25	-4.844	0.74262	0.167485	10.40002	7.537854	0.761272	77.2906	-4.24699	-0.07449
34	-1.375	-4.844	0.578189	0.343962	6.310755	6.671077	0.672764	59.2518	-2.96356	-0.09875
35	-1.5	-4.844	0.566505	0.450676	5.749233	6.061145	0.724029	51.4841	-0.49877	-0.01961
36	-1.625	-4.844	0.568314	0.508797	5.238241	5.726084	0.762793	48.1628	-1.32559	-0.06072
37	-1.75	-4.844	0.572721	0.548559	4.854118	5.423629	0.793049	46.2345	1.29635	0.067675
38	-1.875	-4.844	0.589105	0.571061	5.385549	5.911393	0.820461	45.8911	-1.07529	-0.04642
39	-2	-4.844	0.590632	0.596073	5.478931	5.91958	0.840557	44.6414	0.729665	0.03092

A	A	B	C	D	E
1					
2	Pitchwise Survey at Station 1E				
3					
4					
5	X(in)	Y(in)	U/Vref	V/Vref	Utot/Vref
6					
7	2	-4.82	0.625327	0.433766	0.93201
8	1.94	-4.82	0.631169	0.383355	0.915597
9	1.87	-4.82	0.637051	0.320049	[illegible]
10	1.81	-4.82	0.202815	0.143025	0.247384
11	1.75	-4.82	0.719817	0.607623	0.880427
12	1.69	-4.82	0.536799	0.191091	0.569757
13	1.62	-4.82	[illegible]	0.334117	0.626029
14	1.56	-4.82	0.53107	0.411461	0.671751
15	1.5	-4.82	0.532242	0.463869	[illegible]
16	1.44	-4.82	0.540827	0.486349	0.733685
17	1.37	-4.82	0.547463	0.513486	0.750297
18	1.31	-4.82	0.543866	0.543866	0.770227
19	1.25	-4.82	0.551	0.569206	0.784295
20	1.19	-4.82	0.569206	0.582723	0.792602
21	1.12	-4.82	0.561551	0.573274	0.803053
22	1.06	-4.82	0.560378	0.593204	0.815949
23	1	-4.82	0.572102	0.603756	0.832361
24	0.937	-4.82	0.577984	0.611961	0.84174
25	0.875	-4.82	0.617823	0.613134	[illegible]
26	0.812	-4.82	0.616851	0.617823	0.872221
27	0.75	-4.82	0.622512	0.634236	[illegible]
28	0.687	-4.82	0.642442	0.637753	0.906046
29	0.625	-4.82	0.644767	0.64127	0.908863
30	0.562	-4.82	0.660649	0.651621	0.921459
31	0.5	-4.82	0.661621	0.662372	0.929986
32	0.437	-4.82	0.674086	0.667061	0.948423
33	0.375	-4.82	0.683474	0.670578	0.957602
34	0.312	-4.82	0.684646	0.689409	0.957602
35	0.25	-4.82	0.708821	0.667061	0.97167
36	0.187	-4.82	0.710439	0.677612	0.981246
37	0.125	-4.82	0.702232	0.686619	0.982421
38	0.0625	-4.82	0.696198	0.694025	0.983593
39	-0.0001	-4.82	0.703404	0.702232	0.994144
40	-0.0625	-4.82	0.719817	0.694646	0.992972
41	-0.125	-4.82	0.726861	0.704578	1.011729
42	-0.187	-4.82	0.728023	0.701059	1.010567
43	-0.25	-4.82	0.736229	0.701059	1.016419
44	-0.313	-4.82	0.739746	0.718644	1.031059
45	-0.375	-4.82	0.75147	0.697542	1.024625
46	-0.437	-4.82	0.756159	0.705749	1.034004
47	-0.5	-4.82	0.76671	0.708821	1.043362
48	-0.562	-4.82	0.7714	0.705749	1.045727
49	-0.625	-4.82	0.785468	0.699667	1.051569
50	-0.687	-4.82	0.790157	0.676667	1.04221
51	-0.75	-4.82	0.803053	0.652993	1.035176
52	-0.812	-4.82	0.808914	0.629546	1.025797
53	-0.875	-4.82	0.813604	0.573274	0.995317
54	-0.937	-4.82	0.817121	0.502934	0.960146
55	-1	-4.82	0.82161	0.425659	0.924976
56	-1.06	-4.82	0.825327	0.38101	0.908683
57	-1.12	-4.82	0.8266	0.314187	0.883844
58	-1.19	-4.82	0.349186	0.171162	0.388044
59	-1.25	-4.82	0.689163	0.149542	0.703404
60	-1.31	-4.82	0.577984	0.221572	0.618995
61	-1.37	-4.82	0.551	0.349186	0.651621
62	-1.44	-4.82	0.547463	0.412664	0.685819
63	-1.5	-4.82	0.554517	0.463074	0.722161
64	-1.56	-4.82	0.567412	0.493656	0.75147
65	-1.62	-4.82	0.58617	0.504106	0.772572
66	-1.69	-4.82	0.583825	0.520519	0.781951
67	-1.75	-4.82	0.587342	0.546855	0.804225
68	-1.81	-4.82	0.595549	0.561551	0.819466
69	-1.88	-4.82	0.597693	0.575619	0.830017
70	-1.94	-4.82	0.599066	0.586515	0.839395
71	-2	-4.82	0.608444	0.600236	0.854636
72					
73					

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 2									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-1.1421	-4.792	0.84622	0.299073	2.531737	2.531112	0.897514	70.5354	0.363851	0.078442
8	-1.1322	-4.792	0.846912	0.316967	2.296563	2.946563	0.904283	69.4811	-0.22899	-0.04675
9	-1.1212	-4.792	0.843549	0.332368	2.659542	3.453303	0.906666	68.495	-0.30602	-0.04603
10	-1.1092	-4.792	0.839085	0.350861	2.262387	3.48338	0.909488	67.3079	-0.56685	-0.10023
11	-1.096	-4.792	0.836763	0.367117	2.266012	3.495869	0.913754	66.3113	-0.32189	-0.05614
12	-1.0814	-4.792	0.835939	0.382051	2.348654	3.58333	0.919107	65.4381	-0.04897	-0.00804
13	-1.0654	-4.792	0.833354	0.394856	2.386051	3.685724	0.922165	64.6477	-0.20284	-0.03186
14	-1.0477	-4.792	0.831344	0.408039	2.3996	4.054896	0.926083	63.8574	-0.31353	-0.04452
15	-1.0284	-4.792	0.829677	0.421766	2.464512	4.242689	0.930904	63.0591	-0.28711	-0.03793
16	-1.007	-4.792	0.825143	0.431896	2.599101	4.879436	0.93134	62.3715	-0.37981	-0.04137
17	-0.9836	-4.792	0.823963	0.448977	2.519654	4.929947	0.938347	61.4141	0.166956	0.018568
18	-0.9577	-4.792	0.822916	0.488984	3.010382	8.781768	0.957233	59.2806	1.5186	0.079369
19	-0.9295	-4.792	0.819967	0.520394	3.107017	10.38706	0.971162	57.5966	3.47764	0.148868
20	-0.8983	-4.792	0.817284	0.569694	3.196916	12.62225	0.996246	55.1213	4.06359	0.139035
21	-0.8639	-4.792	0.815607	0.599728	3.376067	13.00891	1.012368	53.6724	5.19462	0.163426
22	-0.8262	-4.792	0.811674	0.627776	3.626106	13.78741	1.026118	52.2805	5.16968	0.142855
23	-0.7846	-4.792	0.80503	0.655125	3.729599	13.86441	1.037912	50.8617	4.883	0.13046
24	-0.7389	-4.792	0.805016	0.680578	3.801236	14.02024	1.054152	49.7881	5.93235	0.15378
25	-0.6888	-4.792	0.793288	0.708932	4.342894	13.10235	1.063903	48.214	8.8236	0.214226
26	-0.6334	-4.792	0.784067	0.713639	4.304803	13.44459	1.060209	47.6923	6.80889	0.162528
27	-0.5726	-4.792	0.776178	0.743668	4.816513	12.00043	1.07494	46.2254	7.49319	0.179024
28	-0.506	-4.792	0.763022	0.735685	4.788016	12.20148	1.059923	46.045	3.89141	0.092022
29	-0.432	-4.792	0.753551	0.742064	5.02898	11.47023	1.05759	45.4401	0.908746	0.021764
30	-0.3512	-4.792	0.741467	0.741414	5.297506	11.57043	1.048555	45.0021	-0.01269	-0.00029
31	-0.2621	-4.792	0.731038	0.73386	5.856138	10.77446	1.035841	44.8896	-1.12868	-0.02471
32	-0.1642	-4.792	0.723278	0.732678	6.447299	10.35092	1.029538	44.63	-2.85278	-0.05906
33	-0.0564	-4.792	0.713914	0.728588	6.70739	9.983844	1.020055	44.4171	-3.90589	-0.08058
34	0.062	-4.792	0.706281	0.71368	7.188737	9.18777	1.004077	44.7014	-3.45345	-0.07223
35	0.1923	-4.792	0.695166	0.703175	7.338524	8.705311	0.988793	44.8719	-4.14156	-0.08956
36	0.3358	-4.792	0.693792	0.693251	7.347469	8.28677	0.980787	45.0224	-5.8767	-0.1288
37	0.4934	-4.792	0.674875	0.679683	6.79781	7.322295	0.957823	44.7966	-3.96202	-0.10997
38	0.667	-4.792	0.646575	0.65194	6.673387	7.012262	0.918197	44.7633	-1.66913	-0.04928

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 2a									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-1.1331	-4.7906	0.514764	0.185144	32.32794	14.97263	0.547047	70.218	280.812	0.801479
8	-1.1233	-4.7905	0.828393	0.329942	6.423284	4.243945	0.891882	68.283	7.20231	0.366004
9	-1.1122	-4.7905	0.840317	0.340244	2.345802	3.251016	0.906587	67.957	0.018332	0.003321
10	-1.1001	-4.7905	0.83873	0.354318	2.439791	3.591935	0.9105	67.0966	-0.23011	-0.03828
11	-1.087	-4.7905	0.838803	0.365879	2.225061	3.62258	0.915127	66.4336	-0.3524	-0.0604
12	-1.0724	-4.7905	0.834451	0.38097	2.355412	3.58478	0.917304	65.4609	-0.32	-0.05236
13	-1.0563	-4.7905	0.832641	0.398442	2.298987	3.828519	0.922202	64.5397	-0.24173	-0.03894
14	-1.0388	-4.7905	0.831602	0.408983	2.294306	4.068867	0.925849	63.923	-0.15781	-0.02335
15	-1.0194	-4.7905	0.828548	0.418281	2.479587	4.255344	0.928135	63.2148	-0.20436	-0.02676
16	-0.998	-4.7905	0.824338	0.434948	2.47803	4.624233	0.932048	62.1824	-0.05552	-0.0067
17	-0.9746	-4.7905	0.825225	0.453542	2.500787	5.552399	0.941646	61.2089	0.209611	0.020855
18	-0.9488	-4.7905	0.820439	0.477279	2.464501	6.855728	0.949165	59.8119	0.640227	0.052349
19	-0.9205	-4.7905	0.820518	0.540074	3.028777	11.69466	0.982308	56.6486	2.84807	0.111083
20	-0.8893	-4.7905	0.816037	0.57974	3.284966	13.08971	1.000192	54.5756	6.50779	0.209087
21	-0.8548	-4.7905	0.812807	0.605117	3.272501	13.48362	1.013323	53.3332	3.56862	0.111833
22	-0.8172	-4.7905	0.806236	0.629818	3.474762	14.08449	1.024655	52.0725	4.85445	0.131388
23	-0.7757	-4.7905	0.8071	0.668924	3.519681	13.92305	1.048269	50.3481	5.22514	0.147304
24	-0.7299	-4.7905	0.797238	0.679532	3.849896	13.98557	1.047546	49.5572	4.47017	0.114896
25	-0.6798	-4.7905	0.793216	0.707861	4.140723	13.62735	1.083002	48.2626	5.79176	0.1419
26	-0.6244	-4.7905	0.788926	0.72714	4.331317	12.8975	1.07144	47.2812	5.93854	0.148861
27	-0.5636	-4.7905	0.777055	0.741777	4.604112	11.94194	1.074266	46.3306	5.35624	0.134584
28	-0.4966	-4.7905	0.759035	0.748116	4.827805	10.59751	1.065746	45.4151	3.35112	0.090488
29	-0.4231	-4.7905	0.748811	0.734992	5.202754	11.47248	1.047684	45.4494	3.15946	0.073127
30	-0.3422	-4.7905	0.734715	0.737684	5.472322	11.19863	1.041131	44.8853	-1.19067	-0.02684
31	-0.2532	-4.7905	0.719986	0.741607	5.824292	10.04714	1.033602	44.1517	-0.52864	-0.01248
32	-0.1552	-4.7905	0.71551	0.731163	6.262041	9.699322	1.023011	44.3801	-2.72741	-0.06204
33	-0.0475	-4.7905	0.711644	0.722929	6.988422	9.919305	1.014428	44.5493	-3.13566	-0.06249
34	0.071	-4.7905	0.703037	0.717719	7.047873	9.229857	1.00468	44.4079	-5.7445	-0.122
35	0.2014	-4.7905	0.692302	0.708841	7.315348	7.79023	0.990827	44.3237	-4.29378	-0.10409
36	0.3448	-4.7905	0.682238	0.693537	7.31728	7.900846	0.972854	44.5295	-3.37444	-0.08064
37	0.5026	-4.7904	0.660875	0.669966	7.117754	7.51481	0.941089	44.6086	-3.8236	-0.09676
38	0.676	-4.7905	0.645491	0.656611	6.628875	6.954294	0.920759	44.5107	-1.82948	-0.05483

	A	A	B	C	D	E	F	G	H	I	J
1											
2		Pitchwise Survey at Station 2b									
3											
4											
5		X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6									Mean	Stress	Coeff.
7		-1.0928	-4.75	0.031676	-0.00192	12.47551	-12.3486	0.031735	93.4677	63.6356	0.56851
8		-1.083	-4.75	0.078754	0.024146	16.57095	14.62206	0.082373	72.9546	102.31	0.581134
9		-1.0719	-4.75	0.163201	0.079793	20.69629	17.0971	0.181663	63.9447	149.267	0.580531
10		-1.06	-4.75	0.289914	0.158746	27.78346	20.16143	0.33053	61.2965	289.598	0.711548
11		-1.0467	-4.75	0.447782	0.246532	29.33952	20.4421	0.511161	61.1645	304.888	0.699646
12		-1.0321	-4.75	0.610322	0.324345	24.86303	17.8687	0.691153	62.0124	228.02	0.705819
13		-1.0162	-4.75	0.787981	0.421295	9.006312	7.805426	0.893536	61.8687	16.7339	0.327618
14		-0.9985	-4.75	0.822695	0.439194	3.298786	5.66025	0.932588	61.9046	1.7892	0.131881
15		-0.9791	-4.75	0.826192	0.453393	2.516516	4.97794	0.942422	61.2432	0.534219	0.058693
16		-0.9577	-4.75	0.825869	0.464599	2.544832	5.862778	0.947581	60.6397	-0.15193	-0.01402
17		-0.9343	-4.75	0.822617	0.529741	2.998571	12.23814	0.978429	57.2197	-0.07065	-0.00265
18		-0.9085	-4.7499	0.819586	0.568478	3.195469	13.7142	0.998303	55.3487	2.55061	0.080104
19		-0.8803	-4.7499	0.81836	0.615638	3.294097	14.32362	1.024072	53.0465	2.33818	0.068203
20		-0.849	-4.75	0.812099	0.640992	3.524332	14.71706	1.034591	51.7159	1.88299	0.049965
21		-0.8146	-4.75	0.807852	0.660219	3.54585	14.95318	1.04332	50.7425	2.91721	0.075723
22		-0.7769	-4.75	0.803025	0.684785	3.748079	14.78568	1.055358	49.5439	3.63139	0.090234
23		-0.7352	-4.75	0.798395	0.699565	3.985667	14.33618	1.060018	48.7035	0.033209	0.000804
24		-0.6896	-4.75	0.795115	0.72504	4.169546	14.03163	1.076054	47.6393	6.81932	0.180421
25		-0.6394	-4.75	0.783414	0.755619	4.302284	11.7343	1.088438	46.0347	5.3608	0.146147
26		-0.5841	-4.75	0.778143	0.760663	4.452061	12.32772	1.08831	45.6433	4.01119	0.100588
27		-0.5233	-4.75	0.758722	0.74854	4.942768	12.43287	1.06582	45.387	2.52793	0.056616
28		-0.4583	-4.75	0.745704	0.753022	4.99929	11.32259	1.059773	44.7202	1.19807	0.02913
29		-0.3829	-4.75	0.735362	0.745628	5.352903	11.29104	1.047243	44.6028	-0.8589	-0.01956
30		-0.3019	-4.75	0.721528	0.753357	5.308979	10.37191	1.043144	43.7637	-0.75732	-0.01893
31		-0.2128	-4.75	0.713579	0.745548	6.092813	9.853462	1.032007	43.7449	-2.33571	-0.05355
32		-0.1149	-4.75	0.708531	0.737731	6.379938	9.828795	1.022871	43.8434	-3.17024	-0.06961
33		-0.0072	-4.75	0.699287	0.725464	6.968953	8.976669	1.007621	43.9474	-3.52482	-0.07757
34		0.1113	-4.75	0.686028	0.716358	6.991172	8.836055	0.991868	43.761	-3.52906	-0.07863
35		0.2417	-4.75	0.678389	0.699912	7.198964	8.820573	0.974725	44.1054	-7.87775	-0.17079
36		0.3851	-4.75	0.670256	0.691421	7.460349	8.185731	0.962967	44.1095	-3.06439	-0.06906
37		0.5428	-4.75	0.652963	0.673251	6.949097	7.306926	0.937885	44.1236	-2.16226	-0.05861
38		0.7163	-4.75	0.636579	0.650354	6.490623	6.867285	0.910051	44.3868	-2.90785	-0.08979

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 3									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-0.916	-4.542	-0.04741	-0.0765	-4.78085	-4.76987	0.09	211.786	4.37949	0.265692
8	-0.9061	-4.542	-0.04994	-0.07787	-4.99584	-4.96297	0.09251	212.67	4.38616	0.244739
9	-0.8951	-4.542	-0.02459	-0.03349	-10.4809	-15.3	0.041552	216.291	73.8739	0.638559
10	-0.8831	-4.542	0.010015	0.025227	15.09999	23.3007	0.027142	21.6531	189.38	0.74466
11	-0.8699	-4.542	0.195803	0.258238	29.97592	39.36851	0.324077	37.1704	783.786	0.895449
12	-0.8553	-4.542	0.278102	0.342576	31.92786	41.17597	0.43999	38.8673	857.97	0.902889
13	-0.8393	-4.542	0.372907	0.459895	31.56891	40.13113	0.591928	39.0492	815.874	0.890845
14	-0.8217	-4.542	0.434126	0.508009	30.81043	38.57696	0.668235	40.5161	762.412	0.887433
15	-0.8023	-4.542	0.495195	0.555257	29.89587	37.29889	0.743995	41.7278	712.001	0.883367
16	-0.7811	-4.542	0.524276	0.571309	27.08807	34.8091	0.775409	42.5419	570.672	0.837305
17	-0.7575	-4.542	0.688754	0.765671	10.70827	17.11747	1.029871	41.9727	75.1521	0.567221
18	-0.7317	-4.542	0.694988	0.753592	9.672081	17.48436	1.025139	42.6833	61.7434	0.505114
19	-0.7035	-4.542	0.71137	0.762208	7.438808	15.51582	1.042598	43.0241	32.8266	0.39118
20	-0.6722	-4.542	0.723207	0.783637	6.255722	13.84835	1.066356	42.7034	11.2507	0.179868
21	-0.6378	-4.542	0.722509	0.767196	5.840164	14.62694	1.053856	43.2817	0.894489	0.014487
22	-0.6001	-4.542	0.717949	0.792008	5.324646	12.74158	1.068983	42.1921	-0.34341	-0.007
23	-0.5585	-4.542	0.720016	0.785636	5.509242	13.24025	1.065868	42.5045	-8.3566	-0.15849
24	-0.5128	-4.542	0.712583	0.796732	5.347273	12.30617	1.068905	41.8089	-7.301	-0.1535
25	-0.4626	-4.542	0.715142	0.779816	5.637497	13.48076	1.058065	42.5229	-15.5378	-0.28285
26	-0.4073	-4.542	0.706554	0.786643	5.633615	12.61516	1.057367	41.9298	-15.6511	-0.30467
27	-0.3485	-4.542	0.692606	0.790355	5.269107	11.75946	1.050889	41.2288	-11.0751	-0.24728
28	-0.2796	-4.542	0.687914	0.798271	5.801403	10.79422	1.053784	40.7533	-5.54343	-0.12247
29	-0.206	-4.542	0.682504	0.777553	6.037184	11.5357	1.034602	41.2753	-8.78027	-0.17442
30	-0.1251	-4.542	0.684174	0.781966	6.594823	10.71073	1.039037	41.1832	-4.21765	-0.06261
31	-0.038	-4.542	0.672196	0.768665	7.243513	10.25944	1.021124	41.1696	-6.78383	-0.12629
32	0.0619	-4.542	0.654738	0.752175	6.528684	10.5531	0.997221	41.0382	-10.3242	-0.20731
33	0.1696	-4.542	0.654216	0.750997	7.035506	9.346982	0.995989	41.0601	-6.50301	-0.13681
34	0.2881	-4.542	0.646347	0.736781	7.300557	8.833712	0.980108	41.2591	-3.30816	-0.07097
35	0.4185	-4.542	0.644355	0.719892	7.530381	8.899089	0.966145	41.8308	-8.62473	-0.17805
36	0.562	-4.542	0.631389	0.701787	7.198029	8.075529	0.944011	41.9773	-7.99586	-0.1903
37	0.7196	-4.542	0.615736	0.675429	7.01761	7.657204	0.913967	42.353	-4.89398	-0.126
38	0.8932	-4.542	0.590615	0.64537	6.226736	7.489904	0.87483	42.4634	-4.38682	-0.13013

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 4									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-0.7107	-4.292	0.212372	0.323567	21.06196	31.09684	0.387038	33.2787	334.394	0.705
8	-0.7007	-4.292	0.23211	0.352861	22.65667	33.21171	0.422358	33.3367	397.691	0.729804
9	-0.6897	-4.292	0.269582	0.412049	23.3677	34.50698	0.492402	33.1947	424.492	0.72693
10	-0.6777	-4.2921	0.304871	0.457987	23.72603	34.626	0.55018	33.6508	448.847	0.750098
11	-0.6645	-4.292	0.332136	0.490965	23.7325	35.0113	0.592749	34.0787	460.451	0.765206
12	-0.6498	-4.292	0.372165	0.544244	22.25359	33.3169	0.659323	34.3651	394.254	0.734276
13	-0.6339	-4.292	0.499627	0.718065	11.51407	18.88317	0.874783	34.8301	52.26	0.331905
14	-0.6163	-4.292	0.51995	0.743408	10.82145	17.74731	0.907196	34.9695	52.3975	0.376738
15	-0.5969	-4.292	0.559617	0.798693	6.843428	11.94629	0.97535	35.0272	14.4705	0.244412
16	-0.5757	-4.292	0.568093	0.794887	8.260377	13.68006	0.975646	35.458	26.815	0.35211
17	-0.5522	-4.292	0.579297	0.807163	6.857309	12.03085	0.993528	35.6668	19.4826	0.326096
18	-0.5263	-4.292	0.590361	0.818551	6.261019	11.13925	1.009234	35.8001	19.6996	0.390036
19	-0.498	-4.292	0.597103	0.822718	5.640634	10.93935	1.016561	35.971	15.2902	0.342168
20	-0.4668	-4.292	0.602606	0.82896	5.079415	10.54437	1.024787	36.0105	14.3574	0.370157
21	-0.4324	-4.292	0.607994	0.829042	4.144499	10.21397	1.02809	36.2552	10.7102	0.349366
22	-0.3947	-4.292	0.606314	0.821435	4.187875	10.82873	1.020986	36.4316	11.8447	0.360664
23	-0.3531	-4.292	0.609032	0.829991	3.548796	9.736868	1.029468	36.2706	5.90169	0.235843
24	-0.3074	-4.292	0.603651	0.818378	3.448541	9.992808	1.016925	36.4132	6.10402	0.24459
25	-0.2572	-4.292	0.604035	0.820134	3.279124	9.944369	1.018567	36.3719	3.16628	0.134079
26	-0.2019	-4.292	0.602507	0.834266	3.106244	7.881424	1.029084	35.8368	3.33876	0.188318
27	-0.1411	-4.292	0.592049	0.834838	2.806094	7.601265	1.023463	35.3434	5.39558	0.34905
28	-0.0742	-4.292	0.59039	0.821556	3.202988	8.069361	1.011689	35.7019	3.4652	0.185132
29	-0.0007	-4.292	0.581994	0.810146	3.231531	7.805841	0.997523	35.6928	2.80954	0.153799
30	0.0803	-4.292	0.570456	0.814623	2.718698	6.647354	0.994499	35.0024	5.63169	0.430306
31	0.1695	-4.292	0.580915	0.788948	4.760754	8.266202	0.979746	36.3648	-0.11488	-0.00403
32	0.2673	-4.292	0.593501	0.762316	6.903488	10.12004	0.966109	37.9028	-10.0238	-0.19812
33	0.3749	-4.292	0.57748	0.75692	6.348584	8.777239	0.952056	37.3413	-5.28021	-0.13085
34	0.4934	-4.292	0.578086	0.739644	7.140233	9.101547	0.938753	38.0102	-9.42362	-0.20023
35	0.6239	-4.292	0.561093	0.717685	6.461999	8.211398	0.910986	38.0187	-4.12614	-0.10738
36	0.7673	-4.292	0.555918	0.700528	6.560668	7.557505	0.894307	38.4345	-3.76355	-0.10481
37	0.925	-4.292	0.551098	0.665751	6.750288	7.642421	0.864254	39.6174	-3.03193	-0.08115
38	1.0985	-4.292	0.530426	0.645169	5.739523	7.054988	0.835221	39.4253	-0.25585	-0.00872

Pitchwise Survey at Station 5

	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 5									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-0.5409	-4.042	0.270295	0.430902	16.77976	25.78195	0.508681	32.0992	170.44	0.544282
8	-0.531	-4.042	0.287194	0.46302	16.91602	26.8656	0.544856	31.8097	176.171	0.535543
9	-0.52	-4.042	0.292558	0.479302	18.7929	29.94864	0.561534	31.3992	256.358	0.626799
10	-0.5081	-4.042	0.313064	0.502849	18.65518	29.6076	0.59234	31.9055	249.442	0.623906
11	-0.4948	-4.042	0.329578	0.52162	19.05018	30.74589	0.617016	32.2861	267.175	0.630176
12	-0.4802	-4.0419	0.345223	0.557454	19.50248	30.83041	0.655693	31.7694	277.447	0.637475
13	-0.4642	-4.042	0.45046	0.699692	10.92393	19.58233	0.832156	32.7734	46.2553	0.299031
14	-0.4466	-4.0419	0.477483	0.741849	9.118786	17.00481	0.88223	32.767	27.532	0.245291
15	-0.4272	-4.042	0.492676	0.768378	8.874577	15.97446	0.91276	32.6676	27.3198	0.266229
16	-0.4061	-4.042	0.506257	0.796645	7.718798	13.67468	0.94497	32.5377	23.6282	0.304798
17	-0.3825	-4.0419	0.518874	0.803008	7.720077	13.75103	0.954976	32.7682	26.8332	0.349195
18	-0.3568	-4.0419	0.53699	0.834856	5.942388	10.60314	0.992478	32.7559	14.6694	0.321639
19	-0.3283	-4.0419	0.540627	0.843326	4.997138	9.254575	1.001736	32.6625	10.3852	0.310235
20	-0.2972	-4.0419	0.54569	0.845602	4.586152	9.34804	1.006389	32.8353	8.86528	0.28574
21	-0.2626	-4.042	0.546364	0.847454	4.253617	9.174705	1.008311	32.8104	9.70281	0.343478
22	-0.225	-4.042	0.545802	0.843675	3.828299	9.569806	1.004832	32.9002	8.22776	0.310259
23	-0.1834	-4.042	0.544584	0.836343	3.203376	9.498181	0.998019	33.0701	6.59358	0.299381
24	-0.1378	-4.0419	0.545328	0.858927	2.521506	7.368697	1.017417	32.4113	4.24968	0.316064
25	-0.0875	-4.042	0.539585	0.848954	2.453992	7.478586	1.00592	32.4396	3.69063	0.277818
26	-0.0322	-4.042	0.538423	0.850713	2.335098	7.437505	1.006783	32.33	2.2509	0.179051
27	0.0285	-4.042	0.539232	0.832406	2.74841	9.236539	0.991801	32.9352	0.711242	0.038706
28	0.0955	-4.0419	0.530365	0.839086	2.274867	7.511499	0.992633	32.2966	1.62617	0.131473
29	0.1691	-4.042	0.525338	0.826803	2.460891	7.635902	0.979583	32.4312	0.014287	0.001042
30	0.2499	-4.0419	0.521348	0.824648	2.729561	7.241458	0.975627	32.3013	0.893932	0.06248
31	0.3391	-4.042	0.515449	0.811554	3.068396	7.102935	0.96141	32.4212	0.454304	0.028611
32	0.4371	-4.0419	0.514242	0.788593	4.059684	8.049252	0.941449	33.1084	-3.45327	-0.14599
33	0.5447	-4.0419	0.531021	0.766268	5.983114	8.935532	0.932282	34.7218	-8.38249	-0.21661
34	0.6631	-4.042	0.526957	0.748638	7.158448	9.092058	0.915501	35.1413	-7.13093	-0.15141
35	0.7936	-4.0419	0.520423	0.73342	7.109295	8.497993	0.899302	35.3589	-6.55171	-0.14982
36	0.937	-4.0419	0.509543	0.710725	6.928917	7.462113	0.874509	35.638	-2.62328	-0.07009
37	1.0946	-4.0419	0.491104	0.689496	6.156822	6.99632	0.846516	35.4609	-2.53765	-0.08139
38	1.2682	-4.0419	0.475787	0.676952	6.083178	6.353441	0.827428	35.101	2.22852	0.079658

	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 6									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-0.3825	-3.7919	0.291545	0.530557	12.80063	20.78082	0.605384	28.789	79.3759	0.411949
8	-0.3725	-3.792	0.332725	0.600174	11.67663	18.19775	0.686231	29.0032	46.8369	0.304514
9	-0.3614	-3.792	0.283184	0.509619	16.70771	27.97193	0.583014	29.06	210.509	0.622278
10	-0.3494	-3.792	0.357269	0.632927	12.04359	19.12274	0.726799	29.4435	47.048	0.28222
11	-0.3363	-3.7921	0.351738	0.626151	12.47693	20.72283	0.71818	29.3249	59.3593	0.317165
12	-0.3218	-3.7921	0.367174	0.642762	12.30675	20.92288	0.740243	29.7369	55.0746	0.29544
13	-0.3057	-3.792	0.380409	0.658776	12.38947	20.6708	0.760722	30.0042	56.515	0.304864
14	-0.288	-3.792	0.399574	0.681534	11.18618	20.59168	0.79003	30.3825	53.1269	0.318647
15	-0.2688	-3.7921	0.325469	0.568996	18.80668	32.9678	0.655506	29.7696	321.185	0.715681
16	-0.2474	-3.7921	0.428102	0.732354	11.3814	19.79646	0.848301	30.3087	66.4934	0.407667
17	-0.2239	-3.792	0.447313	0.772179	8.904339	16.13808	0.892384	30.0831	33.6522	0.323528
18	-0.1981	-3.7921	0.468352	0.815213	7.502689	13.50817	0.940173	29.878	24.4731	0.333602
19	-0.1698	-3.792	0.468898	0.813863	7.188618	13.69251	0.939275	29.9479	25.2088	0.353915
20	-0.1386	-3.792	0.468205	0.795756	7.855402	16.01364	0.92328	30.4716	38.3959	0.421677
21	-0.1042	-3.792	0.480089	0.836307	5.92535	11.97809	0.964299	29.8573	19.6816	0.383102
22	-0.0685	-3.792	0.483464	0.842778	4.529503	10.00926	0.971603	29.8409	7.54161	0.229808
23	-0.025	-3.792	0.486491	0.852399	3.667391	8.674493	0.981457	29.7148	4.31797	0.183287
24	0.0207	-3.792	0.485692	0.854838	3.049209	8.322973	0.98318	29.6039	1.26891	0.089075
25	0.071	-3.792	0.486028	0.860429	2.726366	7.338107	0.988211	29.4607	0.375894	0.025957
26	0.1263	-3.792	0.477765	0.858715	2.475465	6.865488	0.982676	29.0903	1.04766	0.085162
27	0.187	-3.792	0.475059	0.853929	2.405041	6.793612	0.977177	29.0881	-0.41713	-0.03527
28	0.2541	-3.792	0.472287	0.833478	2.755072	7.781704	0.957987	29.5379	-2.38	-0.15336
29	0.3276	-3.792	0.464585	0.832795	2.638516	6.863668	0.953617	29.1555	-1.26481	-0.09649
30	0.4085	-3.792	0.462835	0.820586	3.00861	7.95737	0.942113	29.4243	-3.52377	-0.20334
31	0.4976	-3.792	0.452844	0.820358	2.677707	6.547293	0.937047	28.899	-0.58117	-0.0458
32	0.5955	-3.792	0.450385	0.795831	3.645921	7.245361	0.914436	29.5068	-3.04317	-0.15915
33	0.7031	-3.792	0.460755	0.783592	5.171242	7.839684	0.909018	30.4557	-4.48127	-0.15271
34	0.8216	-3.792	0.453596	0.768681	5.346765	7.501247	0.892535	30.5447	-1.56542	-0.05461
35	0.9521	-3.792	0.465262	0.749804	6.730291	7.950544	0.882425	31.8201	-2.79114	-0.07206
36	1.0955	-3.792	0.454198	0.720303	6.505659	7.108454	0.851548	32.2341	-2.78605	-0.08323
37	1.2532	-3.792	0.438191	0.716613	6.312222	6.631469	0.839968	31.4447	0.620797	0.020488
38	1.4267	-3.792	0.41619	0.70572	5.535075	5.881909	0.819301	30.5295	6.45742	0.274012

A	A	B	C	D	E	F	G	H	I	J
1	Pitchwise Survey at Station 7									
2										
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-0.1434	-3.2921	0.180613	0.458568	12.80234	28.40004	0.492855	21.4978	156.247	0.636259
8	-0.1335	-3.2921	0.177975	0.45079	14.0877	29.81033	0.484851	21.5444	205.644	0.673946
9	-0.1224	-3.2921	0.179636	0.452785	14.44764	30.64493	0.487118	21.64	211.911	0.658736
10	-0.1105	-3.2921	0.1884	0.473045	14.68542	31.04267	0.509182	21.7159	217.921	0.657918
11	-0.0973	-3.292	0.190992	0.469111	14.97024	31.78397	0.508501	22.153	228.619	0.681289
12	-0.0827	-3.292	0.191613	0.461997	15.39069	33.1659	0.500157	22.5262	245.186	0.661099
13	-0.0667	-3.292	0.204002	0.492604	15.69231	33.51588	0.533174	22.4959	257.524	0.673903
14	-0.0048	-3.292	0.204422	0.469046	16.77647	36.41224	0.511656	23.5488	307.429	0.692647
15	-0.0296	-3.292	0.218381	0.507666	15.75166	34.28792	0.552644	23.2757	260.182	0.663009
16	-0.0084	-3.292	0.213267	0.502102	16.07961	35.46962	0.545517	23.0133	284.869	0.687431
17	0.0151	-3.292	0.218955	0.512033	16.30093	35.87592	0.556883	23.1525	301.399	0.709321
18	0.0408	-3.292	0.229984	0.522408	16.02425	35.86252	0.570792	23.761	279.754	0.669998
19	0.0692	-3.292	0.229857	0.514938	16.6061	36.05697	0.563911	24.0548	299.19	0.687713
20	0.1004	-3.292	0.245152	0.545149	15.83962	35.98155	0.597734	24.2134	276.217	0.667017
21	0.1348	-3.2921	0.244872	0.526572	15.84739	36.79498	0.580724	24.9399	279.928	0.66072
22	0.1725	-3.2921	0.259282	0.558688	16.00137	36.4164	0.615921	24.8956	282.62	0.667521
23	0.2141	-3.2921	0.280929	0.620247	15.00416	34.56899	0.680902	24.3672	248.247	0.658722
24	0.2598	-3.2921	0.273733	0.587117	15.28143	35.15899	0.647794	24.9964	258.186	0.661375
25	0.31	-3.2921	0.298812	0.64653	14.25851	32.8536	0.711407	24.6592	216.859	0.63714
26	0.3654	-3.2921	0.311518	0.669535	13.00887	31.19131	0.738459	24.9514	174.516	0.591941
27	0.426	-3.2921	0.325953	0.695587	12.17994	28.69942	0.76817	25.1079	132.543	0.521861
28	0.493	-3.2921	0.318458	0.688288	12.55538	28.88602	0.758391	24.8291	126.203	0.478926
29	0.5666	-3.2921	0.335316	0.720665	10.63135	25.23298	0.795054	24.9452	83.5102	0.42845
30	0.6474	-3.2921	0.338652	0.722425	10.11276	23.54629	0.797862	25.1158	49.4368	0.285742
31	0.7365	-3.292	0.349025	0.72562	9.685518	21.52913	0.805198	25.6877	34.5881	0.228293
32	0.8345	-3.292	0.353758	0.742107	8.945011	18.51253	0.822112	25.4868	15.042	0.125019
33	0.9422	-3.292	0.361957	0.746758	8.406667	15.51023	0.829855	25.8597	-11.1425	-0.11761
34	1.0606	-3.292	0.360187	0.750201	7.444013	13.55733	0.832187	25.6466	-12.0447	-0.16426
35	1.1911	-3.292	0.366211	0.753859	7.946445	11.69235	0.838101	25.9097	-10.818	-0.16025
36	1.3345	-3.292	0.36953	0.758334	7.76053	10.17586	0.843578	25.9796	-4.29428	-0.07484
37	1.4922	-3.292	0.354856	0.760719	6.74375	7.817534	0.839414	25.0078	3.67147	0.095848
38	1.6657	-3.292	0.336873	0.755315	8.032438	7.614252	0.826952	24.0244	9.31951	0.279246

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 8									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	-0.0083	-2.792	0.107971	0.480594	4.846092	14.9943	0.492573	12.662	13.4256	0.253693
8	0.0016	-2.792	0.094641	0.407006	7.447023	25.16169	0.417865	13.0903	75.4077	0.55257
9	0.0126	-2.792	0.09233	0.390006	8.646002	28.7994	0.400786	13.319	110.516	0.609423
10	0.0245	-2.792	0.10496	0.428596	8.799021	28.53714	0.441261	13.7605	101.744	0.556367
11	0.0377	-2.792	0.106724	0.435602	9.861248	32.62565	0.448486	13.7665	150.655	0.642966
12	0.0525	-2.792	0.106516	0.419374	-0.00149	33.76961	0.433186	14.5074	152.895	0.60931
13	0.0684	-2.792	0.120909	0.444841	10.12984	33.09908	0.46098	15.2059	136.526	0.5591
14	0.086	-2.792	0.131135	0.475956	10.57585	33.84572	0.49369	15.4039	146.599	0.570023
15	0.1054	-2.792	0.127443	0.459167	11.12042	34.44707	0.476526	15.5122	156.345	0.560408
16	0.1267	-2.792	0.13643	0.458212	11.32235	35.73072	0.478091	16.5806	169.275	0.574522
17	0.1502	-2.792	0.155813	0.505342	10.90368	35.63799	0.528818	17.1362	159.415	0.5633
18	0.1759	-2.792	0.154564	0.501917	11.42733	35.95944	0.525177	17.1161	170.044	0.568194
19	0.2043	-2.792	0.156003	0.486588	11.6358	37.57134	0.510983	17.7762	189.258	0.594425
20	0.2354	-2.792	0.169966	0.511814	11.39433	37.70323	0.539298	18.3706	181.834	0.581169
21	0.2699	-2.792	0.181648	0.547763	11.77463	37.26334	0.577096	18.3465	186.384	0.583276
22	0.3075	-2.792	0.202685	0.582988	10.6394	38.01578	0.617217	19.1708	147.466	0.528415
23	0.3493	-2.7919	0.193258	0.548188	11.45045	37.7255	0.581256	19.4195	177.438	0.584006
24	0.3949	-2.792	0.211389	0.611691	10.40201	35.13822	0.647187	19.0642	139.376	0.523582
25	0.4451	-2.792	0.255265	0.803194	5.654295	17.26603	0.842782	17.6309	16.5262	0.232432
26	0.5004	-2.7921	0.264694	0.827271	4.786332	13.22376	0.868586	17.7427	2.06494	0.044796
27	0.5612	-2.7921	0.268771	0.85699	3.11586	7.671635	0.898147	17.4126	-5.88098	-0.33782
28	0.628	-2.792	0.264777	0.865907	2.486036	5.548567	0.905485	17.0026	-3.75024	-0.37633
29	0.7017	-2.792	0.269434	0.859077	2.720933	5.549704	0.900337	17.4131	-5.08819	-0.48267
30	0.7825	-2.792	0.267988	0.853272	2.531916	5.177473	0.894368	17.436	-3.79462	-0.39746
31	0.8717	-2.792	0.26661	0.840108	2.770132	5.09454	0.881398	17.6069	-4.18405	-0.40709
32	0.9696	-2.792	0.265711	0.834493	2.74028	4.88542	0.875775	17.662	-4.41815	-0.45315
33	1.0773	-2.792	0.261865	0.81729	2.592251	4.965803	0.858217	17.7659	-4.04325	-0.43128
34	1.1959	-2.7921	0.261608	0.810753	2.909182	5.079062	0.851915	17.8834	-3.6228	-0.33665
35	1.3262	-2.792	0.260105	0.80091	3.235218	5.440072	0.842088	17.9918	-3.84545	-0.30001
36	1.4696	-2.792	0.261761	0.78923	3.664997	5.649475	0.831507	18.3489	-0.82723	-0.05486
37	1.6273	-2.7921	0.256841	0.785701	3.543762	5.749224	0.826616	18.1023	0.491201	0.033104
38	1.8008	-2.792	0.259002	0.785363	4.301629	6.439735	0.826969	18.2518	4.77142	0.236506

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 9									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	0.0862	-2.292	0.043477	0.310347	5.136796	24.89345	0.313378	7.97481	32.9796	0.354133
8	0.0961	-2.292	0.046773	0.332176	5.723839	25.75988	0.335453	8.01505	42.3584	0.394455
9	0.1071	-2.292	0.049243	0.354268	5.98459	25.98624	0.357674	7.91342	39.315	0.348278
10	0.119	-2.292	0.055301	0.359861	6.215393	27.39299	0.364203	8.73363	45.0998	0.363715
11	0.1323	-2.292	0.053403	0.369038	6.680582	29.01347	0.372881	8.23399	46.8289	0.331737
12	0.1469	-2.292	0.062457	0.396124	6.791023	29.37594	0.401017	8.96002	49.9124	0.343538
13	0.1629	-2.292	0.065373	0.382474	7.018994	31.52547	0.388021	9.69929	50.4289	0.312923
14	0.1806	-2.292	0.076904	0.432386	7.271161	30.77164	0.439172	10.0852	48.4381	0.297254
15	0.2	-2.292	0.079519	0.418146	7.664605	31.6954	0.425641	10.7673	52.5887	0.297235
16	0.2212	-2.292	0.083768	0.438872	7.825014	33.37985	0.446795	10.8061	67.2944	0.353758
17	0.2446	-2.292	0.094579	0.470884	7.887924	33.57947	0.480093	11.3616	56.8247	0.294575
18	0.2705	-2.292	0.103323	0.509632	8.100829	34.12624	0.52	11.4608	71.8276	0.358754
19	0.2987	-2.292	0.110297	0.525818	8.465073	36.22787	0.537066	11.8511	86.4102	0.386869
20	0.33	-2.292	0.117633	0.538607	8.488021	36.49578	0.551303	12.3201	84.315	0.373812
21	0.3645	-2.292	0.126454	0.526358	8.864742	36.89433	0.541335	13.5089	86.6771	0.363892
22	0.4022	-2.292	0.138001	0.588553	8.769053	34.98699	0.604061	13.0113	77.2423	0.345892
23	0.4438	-2.292	0.139377	0.604576	8.420048	35.82368	0.620434	12.9819	78.2794	0.358336
24	0.4894	-2.292	0.148752	0.623913	8.475713	33.88787	0.6414	13.41	70.1102	0.335163
25	0.5397	-2.292	0.178883	0.821536	4.918325	13.32022	0.840786	12.284	6.87448	0.144081
26	0.5949	-2.292	0.183144	0.811287	4.880059	14.99907	0.831701	12.721	5.49718	0.107527
27	0.6557	-2.292	0.18848	0.851517	3.876189	8.211013	0.872128	12.481	-2.99984	-0.12941
28	0.7226	-2.292	0.191424	0.86404	2.917987	5.302849	0.884991	12.4918	-3.27205	-0.29035
29	0.7962	-2.292	0.193106	0.859238	2.899975	5.140032	0.88067	12.6663	-3.72466	-0.3431
30	0.8771	-2.292	0.191999	0.850845	3.108964	5.152529	0.872239	12.7162	-3.78296	-0.32426
31	0.9662	-2.292	0.198698	0.844973	2.743824	4.293868	0.868021	13.2329	-3.90059	-0.45462
32	1.0641	-2.292	0.19855	0.835442	2.878852	4.391374	0.858252	13.239	-4.20635	-0.45686
33	1.1717	-2.292	0.195998	0.830796	3.174389	4.482616	0.853602	13.2743	-4.37103	-0.42178
34	1.2905	-2.292	0.196426	0.827358	2.858097	4.208512	0.850355	13.3555	-3.70527	-0.42297
35	1.4206	-2.292	0.198615	0.815778	2.864558	4.40348	0.839136	13.5507	-3.36313	-0.38809
36	1.5641	-2.292	0.192512	0.808295	2.994086	4.515241	0.830905	13.3966	-3.64677	-0.37039
37	1.7218	-2.292	0.190221	0.806119	3.21111	5.017293	0.828259	13.2773	-1.80475	-0.15381
38	1.8955	-2.292	0.1855	0.800216	3.006389	5.30046	0.821435	13.0513	-1.14841	-0.09889

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 10									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	0.1206	-1.792	0.022259	0.202321	4.095917	20.95179	0.203542	6.27826	5.17505	0.082801
8	0.1305	-1.792	0.021598	0.253587	4.831564	22.0226	0.254504	4.86822	4.4248	0.057099
9	0.1415	-1.792	0.02413	0.266694	5.187335	22.96935	0.267783	5.1699	6.42001	0.073984
10	0.1535	-1.792	0.024839	0.26796	5.438401	24.47976	0.269029	4.93012	8.33057	0.085919
11	0.1667	-1.792	0.027929	0.294341	5.830093	24.89967	0.295664	5.42035	9.34802	0.088419
12	0.1813	-1.7921	0.035124	0.306417	6.017204	25.62082	0.308423	6.53926	9.81707	0.087436
13	0.1973	-1.792	0.036813	0.331483	6.021336	26.75967	0.333521	6.33705	9.37134	0.079859
14	0.2149	-1.792	0.039462	0.360912	6.230679	25.63707	0.362899	5.76441	8.01898	0.068397
15	0.2343	-1.792	0.044196	0.360303	6.786397	26.28786	0.363004	6.99303	14.6841	0.105027
16	0.2556	-1.792	0.048726	0.396319	6.738795	28.80747	0.399303	7.00918	10.7865	0.078294
17	0.2791	-1.792	0.053497	0.45568	6.613386	27.30655	0.45879	6.69616	14.0089	0.108499
18	0.3048	-1.792	0.060648	0.440105	6.841943	31.29159	0.444285	7.84612	20.9406	0.134301
19	0.3332	-1.792	0.066111	0.481982	6.925107	30.86678	0.486474	7.81061	23.2023	0.150014
20	0.3645	-1.792	0.071825	0.504374	6.997745	32.38839	0.509482	8.10467	23.7706	0.144008
21	0.3988	-1.792	0.078611	0.544877	7.236403	31.84293	0.550039	8.00639	36.1288	0.218875
22	0.4365	-1.792	0.088194	0.696531	5.324335	20.13652	0.7011	7.22661	11.6589	0.149314
23	0.4782	-1.792	0.098435	0.750398	4.830896	15.78403	0.756827	7.47322	7.34039	0.137898
24	0.5239	-1.792	0.106315	0.78605	4.242766	14.05772	0.793478	7.84572	5.94806	0.138932
25	0.574	-1.792	0.116082	0.810124	3.849022	12.54599	0.818396	8.153	3.80894	0.108303
26	0.6293	-1.792	0.122362	0.845987	2.901798	7.65266	0.85479	8.23012	-0.89507	-0.05534
27	0.6902	-1.792	0.128047	0.843805	3.095015	8.130953	0.853465	8.62877	-0.69925	-0.03815
28	0.7571	-1.792	0.129036	0.857986	2.594468	4.707602	0.867634	8.55283	-1.41209	-0.15874
29	0.8306	-1.792	0.133457	0.852084	2.571258	4.307616	0.862451	8.90178	-1.95532	-0.2424
30	0.9115	-1.792	0.136007	0.852587	2.195908	3.543805	0.863367	9.06361	-1.98287	-0.34987
31	1.0006	-1.792	0.138327	0.845835	2.340322	3.762053	0.856874	9.29002	-2.35659	-0.36752
32	1.0985	-1.792	0.141028	0.837867	2.715473	3.773841	0.849456	9.55659	-2.53307	-0.3394
33	1.2062	-1.792	0.140694	0.833859	2.936798	3.581857	0.845644	9.57706	-2.99006	-0.3903
34	1.3248	-1.792	0.142951	0.822918	3.245907	3.925244	0.835241	9.85463	-4.1607	-0.44839
35	1.4552	-1.792	0.139802	0.823362	2.841811	3.49704	0.835145	9.63659	-3.24783	-0.44874
36	1.5985	-1.792	0.140382	0.811132	2.275676	3.210614	0.82319	9.8189	-2.08138	-0.39115
37	1.7561	-1.792	0.141098	0.808036	3.244392	4.552556	0.820264	9.90506	-3.44764	-0.3205
38	1.9297	-1.792	0.137455	0.811301	3.017382	4.872461	0.822863	9.61602	-2.7971	-0.26123

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 11									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	0.1435	-1.292	0.011954	0.202404	4.8954	19.89049	0.202847	3.37852	-7.8966	-0.10856
8	0.1534	-1.292	0.013306	0.208878	5.022905	20.78871	0.2094	3.64309	-8.23781	-0.10823
9	0.1644	-1.2921	0.011785	0.23603	5.169876	21.07334	0.236325	2.87063	-8.38317	-0.10493
10	0.1764	-1.292	0.014199	0.236782	5.802982	22.09121	0.237177	3.43209	-8.04795	-0.08812
11	0.1896	-1.292	0.01582	0.268861	5.869449	22.19519	0.26932	3.40544	-8.07834	-0.08385
12	0.2042	-1.292	0.020822	0.28154	6.014419	23.2177	0.282288	4.16894	-8.34967	-0.08232
13	0.2202	-1.292	0.024337	0.308917	6.273647	23.20317	0.309873	4.50447	-11.711	-0.11026
14	0.2378	-1.292	0.024412	0.3123	6.302794	24.92492	0.313253	4.46968	-8.64967	-0.05799
15	0.2573	-1.292	0.027797	0.32042	6.468022	26.41926	0.321623	4.95801	-0.98462	-0.00804
16	0.2784	-1.292	0.029473	0.417628	6.31432	22.12813	0.418896	4.03967	-1.59801	-0.01585
17	0.3018	-1.292	0.036407	0.41896	6.437791	24.80164	0.418399	4.86694	-8.71005	-0.05736
18	0.3278	-1.292	0.037741	0.417496	6.496767	25.34007	0.419169	5.16671	-1.69411	-0.01412
19	0.3561	-1.292	0.04252	0.434693	6.943417	26.99625	0.436679	5.59916	6.22768	0.045547
20	0.3874	-1.292	0.046627	0.457422	7.169627	27.25913	0.459792	5.82028	2.01246	0.014074
21	0.4217	-1.2919	0.050257	0.509642	6.769982	28.64113	0.512014	5.63294	6.47697	0.04578
22	0.4594	-1.2921	0.057236	0.531181	7.043786	30.25111	0.534256	6.15008	10.1968	0.066594
23	0.5009	-1.292	0.064982	0.720078	4.461694	16.45682	0.723003	5.15859	1.71603	0.034162
24	0.5467	-1.292	0.068606	0.607067	6.896382	28.81944	0.610733	6.28625	18.7319	0.133645
25	0.5969	-1.292	0.075367	0.749812	4.018222	16.69375	0.752695	5.74742	5.36606	0.110799
26	0.6521	-1.292	0.082963	0.811149	3.284002	9.847264	0.815383	5.84124	0.493407	0.020911
27	0.713	-1.292	0.086573	0.834601	2.960016	6.974986	0.839377	5.91999	-0.02123	-0.00141
28	0.78	-1.292	0.093073	0.839349	2.694094	5.741174	0.844493	6.32751	-0.55833	-0.04966
29	0.8535	-1.292	0.098221	0.838067	2.660718	5.004871	0.843573	6.54962	-0.74941	-0.07655
30	0.9344	-1.292	0.097633	0.838015	2.47275	3.942197	0.843707	6.65879	-1.90494	-0.26782
31	1.0235	-1.292	0.099576	0.839733	2.722468	3.487547	0.845499	6.69528	-1.40702	-0.20309
32	1.1214	-1.292	0.100769	0.836977	2.418224	3.074494	0.843021	6.86513	-1.56236	-0.288
33	1.2291	-1.292	0.104037	0.831979	2.342465	3.058873	0.838458	7.12768	-1.91047	-0.36568
34	1.3477	-1.2919	0.106829	0.830734	2.129862	2.73854	0.837448	7.25993	-1.35585	-0.31858
35	1.4781	-1.2919	0.107905	0.819129	2.283881	2.865036	0.826206	7.50444	-1.81648	-0.38051
36	1.6213	-1.2921	0.107388	0.816963	2.408282	3.144337	0.823981	7.48854	-1.93464	-0.35
37	1.7791	-1.292	0.103867	0.810252	2.502326	3.349581	0.816865	7.30632	-2.44544	-0.36968
38	1.9526	-1.292	0.102563	0.808571	2.519858	3.579866	0.815048	7.22835	-2.05842	-0.31272

	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 12									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	0.1238	-0.792	0.009896	0.153094	4.134791	18.50475	0.153421	3.73551	-5.54774	-0.11141
8	0.1337	-0.792	0.008081	0.161473	4.54343	17.98017	0.161701	3.04583	-6.26618	-0.10746
9	0.1447	-0.792	0.007802	0.173435	4.924236	17.97545	0.173602	2.50893	-10.2172	-0.1582
10	0.1567	-0.792	0.00736	0.186890	5.302675	18.26673	0.187143	2.25399	-10.8079	-0.14096
11	0.1699	-0.792	0.01008	0.208984	5.884639	19.98873	0.20814	2.8029	-9.76786	-0.12004
12	0.1845	-0.792	0.011486	0.228084	5.829707	19.78515	0.228373	2.87264	-10.4947	-0.13166
13	0.2005	-0.792	0.012286	0.229882	6.169492	21.4627	0.23029	3.05799	-7.66063	-0.0792
14	0.2181	-0.792	0.013673	0.266198	6.087961	20.79202	0.266546	2.94045	-9.05808	-0.09837
15	0.2375	-0.792	0.01614	0.300865	6.390318	20.30478	0.301289	3.07086	-8.85394	-0.09141
16	0.2588	-0.792	0.013883	0.303088	6.349189	22.2829	0.303411	2.64151	-10.6746	-0.10341
17	0.2823	-0.792	0.019733	0.354124	6.47921	21.49971	0.354674	3.18946	-5.82259	-0.05729
18	0.3081	-0.792	0.019807	0.386877	6.460086	20.90867	0.387374	2.90131	-3.70992	-0.03747
19	0.3364	-0.792	0.024583	0.440744	6.46036	20.54427	0.441429	3.19246	-1.68428	-0.01731
20	*0.3678*	*-0.792*	*0.02679*	*0.423414*	*6.886811*	*24.0084*	*0.424261*	*3.62037*	*-1.66795*	*-0.01424*
21	0.402	-0.792	0.031926	0.488122	6.787647	21.4282	0.489165	3.74216	-1.3588	-0.0128
22	0.4397	-0.792	0.03327	0.486808	6.757362	26.23002	0.487744	3.91135	3.31011	0.025594
23	0.4813	-0.792	0.039184	0.513008	6.991333	26.89191	0.514501	4.36789	3.0888	0.023525
24	0.527	-0.792	0.0424	0.593989	6.415886	23.94014	0.595381	4.08381	4.99894	0.044806
25	0.5772	-0.792	0.049361	0.651166	5.992809	23.98894	0.653034	4.3341	5.02804	0.047973
26	0.6325	-0.792	0.055184	0.758193	3.847798	13.83481	0.760198	4.16286	3.27545	0.085564
27	0.6933	-0.7919	0.059849	0.800436	3.27817	9.290823	0.802673	4.27806	0.043898	0.001975
28	0.7602	-0.792	0.061722	0.829839	2.810474	6.111889	0.832131	4.25374	-0.24349	-0.01943
29	0.8338	-0.792	0.066419	0.833801	2.601873	4.613157	0.836542	4.55394	-0.58321	-0.06859
30	0.9147	-0.792	0.069702	0.836258	2.210862	3.433071	0.839157	4.76457	-0.71458	-0.12903
31	1.0038	-0.792	0.072846	0.835741	2.283704	3.29079	0.838893	4.98788	-1.18424	-0.21596
32	1.1002	-0.792	0.073081	0.835384	2.340874	2.940223	0.838553	4.99837	-0.99975	-0.19909
33	1.2094	-0.792	0.076509	0.828387	2.342802	2.8164	0.831912	5.27684	-1.23706	-0.25895
34	1.328	-0.792	0.074944	0.827107	2.170816	2.577995	0.830497	5.17741	-1.08812	-0.26039
35	1.4583	-0.792	0.078894	0.823455	2.524002	2.775768	0.827037	5.33479	-1.53099	-0.29949
36	1.6017	-0.792	0.077731	0.821085	2.478577	2.811052	0.824757	5.40801	-1.32253	-0.28014
37	1.7594	-0.792	0.077186	0.817145	3.01599	3.080984	0.820782	5.39806	-1.95913	-0.29084
38	1.9329	-0.792	0.071529	0.81513	2.7784	2.991992	0.818282	5.01493	-1.69312	-0.27913

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 13									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	0.1238	-0.5	0.00867	0.168511	4.149111	16.38648	0.168643	2.26868	-5.69833	-0.11501
8	0.1337	-0.5	0.005616	0.174875	4.883218	17.48815	0.174862	1.8067	-7.292	-0.12202
9	0.1447	-0.5	0.006746	0.181809	5.036044	17.82779	0.181834	2.12818	-9.18858	-0.14
10	0.1567	-0.5	0.003706	0.208786	5.148897	17.67888	0.208799	1.0169	-6.10873	-0.09199
11	0.1699	-0.5	0.004462	0.218836	5.888822	18.5378	0.218881	1.17832	-10.2222	-0.13527
12	0.1845	-0.4999	0.008437	0.234283	5.701314	18.81098	0.234435	2.06236	-7.98201	-0.10175
13	0.2006	-0.5	0.008809	0.232977	5.883775	19.7812	0.233189	2.43551	-9.42884	-0.10954
14	0.2181	-0.5	0.010808	0.273801	6.283208	19.86106	0.274002	2.19751	-9.88893	-0.10871
15	0.2375	-0.5	0.012135	0.298864	6.088726	18.45138	0.29911	2.32511	-8.92983	-0.10338
16	0.2588	-0.4999	0.010757	0.303111	6.488772	20.76887	0.303302	2.03258	-11.4788	-0.11675
17	0.2823	-0.4999	0.0164	0.337103	6.470919	21.83824	0.337503	2.7853	-9.71684	-0.09513
18	0.308	-0.4999	0.014818	0.33888	6.807482	22.74884	0.338205	2.50369	-8.90774	-0.08122
19	0.3364	-0.4999	0.019608	0.377601	6.861515	21.79857	0.378104	2.96755	-9.74368	-0.08942
20	0.3676	-0.4999	0.021621	0.40214	6.903892	22.57362	0.40272	3.07757	-8.06071	-0.0708
21	0.402	-0.4999	0.024682	0.426766	6.836722	23.00871	0.427479	3.31139	-5.40224	-0.04707
22	0.4397	-0.4999	0.023943	0.491621	6.811567	21.82864	0.492404	2.78708	2.02905	0.018703
23	0.4812	-0.4999	0.03123	0.525773	6.510002	22.97087	0.5267	3.39926	-5.427	-0.04974
24	0.527	-0.4999	0.031245	0.578081	6.3744	24.02192	0.578908	3.10465	3.47923	0.03114
25	0.5772	-0.4999	0.036372	0.601583	6.37543	24.35185	0.602681	3.45992	0.674111	0.005951
26	0.6325	-0.4999	0.03924	0.633384	6.086139	24.95447	0.634578	3.54519	7.33255	0.086168
27	0.6933	-0.4999	0.039486	0.667121	5.983128	23.82894	0.668287	3.3856	10.0902	0.104317
28	0.7603	-0.4999	0.047414	0.80129	3.032704	9.584923	0.802892	3.38839	0.148503	0.008922
29	0.8338	-0.4999	0.050141	0.812383	2.857157	8.178866	0.813929	3.53189	1.07593	0.083116
30	0.9147	-0.4999	0.053787	0.819382	2.632619	6.308949	0.821145	3.75567	-0.94768	-0.07713
31	1.0038	-0.4999	0.056442	0.826095	2.634863	4.905861	0.828021	3.90859	-1.13662	-0.13121
32	1.1002	-0.4999	0.058255	0.834439	2.316997	3.298041	0.836469	3.99352	-1.20091	-0.21816
33	1.2094	-0.4999	0.062648	0.830356	2.260851	2.961614	0.832716	4.31462	-1.02342	-0.21039
34	1.328	-0.4999	0.064058	0.8303	2.507543	2.826861	0.832768	4.41152	-1.53233	-0.29626
35	1.4583	-0.4999	0.06357	0.826547	2.469297	2.717512	0.828968	4.39795	-1.16482	-0.2379
36	1.6017	-0.4999	0.061548	0.824048	2.604722	2.638578	0.826344	4.27151	-1.28117	-0.25149
37	1.7594	-0.4999	0.059628	0.820916	2.692545	2.839909	0.823079	4.15443	-1.67791	-0.30073
38	1.9329	-0.4999	0.058537	0.81787	2.749296	2.944167	0.819962	4.09386	-1.75533	-0.2972

	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 14									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	0.1041	-0.25	0.010303	0.179626	4.756343	15.61025	0.179921	3.28277	-8.30426	-0.15455
8	0.1139	-0.25	0.00909	0.174127	4.808328	17.11317	0.174365	2.98826	-9.25305	-0.16213
9	0.1248	-0.25	0.002926	0.187246	5.194431	18.13415	0.187269	0.895202	-8.02037	-0.11766
10	0.1369	-0.25	0.001425	0.221419	5.409366	17.47363	0.221424	0.369826	-5.55782	-0.07992
11	0.15	-0.25	0.00136	0.218767	5.817479	18.51841	0.218771	0.356119	-10.8574	-0.13927
12	0.1647	-0.25	0.003961	0.23511	6.298002	18.80637	0.236144	0.985258	-9.01472	-0.10518
13	0.1807	-0.25	0.00713	0.236898	6.333604	19.95192	0.237005	1.72394	-8.4049	-0.09191
14	0.1983	-0.25	0.008755	0.239585	6.868698	20.49738	0.239745	2.09268	-14.6985	-0.14447
15	0.2177	-0.25	0.011101	0.269066	6.886286	20.30581	0.269294	2.36244	-12.3678	-0.12242
16	0.2389	-0.25	0.01237	0.292277	7.040197	21.121	0.292538	2.42353	-11.7685	-0.10937
17	0.2625	-0.2501	0.011885	0.321112	7.276306	21.05923	0.321332	2.11989	-16.3206	-0.14718
18	0.2884	-0.2501	0.015476	0.309137	7.669825	22.54207	0.309624	2.86598	-14.6707	-0.11742
19	0.3166	-0.2501	0.015782	0.361042	7.788354	23.075[illegible]7	0.361398	2.57411	-17.9614	-0.13802
20	0.3477	-0.2501	0.020657	0.358276	7.889444	23.80225	0.358865	3.28386	-16.7187	-0.12381
21	0.3823	-0.2501	0.023085	0.391551	8.08454	23.836.	0.38223	3.37127	-17.715	-0.12733
22	0.4199	-0.2501	0.024415	0.403393	7.970396	25.24998	0.404131	3.4636	-22.0542	-0.15143
23	0.4615	-0.2501	0.027496	0.444768	7.830859	25.89656	0.445618	3.53754	-15.7145	-0.10708
24	0.5072	-0.2501	0.031621	0.487862	8.190013	26.9786	0.488875	3.70851	-16.6385	-0.10406
25	0.5574	-0.2501	0.037474	0.513164	7.970461	28.13092	0.514531	4.17664	-15.5749	-0.09599
26	0.6126	-0.25	0.037485	0.545812	7.931076	28.57357	0.547096	3.92872	-16.0584	-0.09792
27	0.6735	-0.2501	0.041685	0.569388	7.923969	29.95711	0.570912	4.18715	-28.1425	-0.16382
28	0.7405	-0.2501	0.041162	0.634691	7.160737	28.48069	0.636024	3.71068	-16.478	-0.11165
29	0.814	-0.2501	0.045903	0.631792	7.563563	28.77244	0.633458	4.15553	-16.7399	-0.10629
30	0.895	-0.2501	0.050184	0.640033	7.730449	28.13465	0.641998	4.48332	-20.7541	-0.13186
31	0.984	-0.2501	0.051042	0.677273	7.668972	25.75082	0.679193	4.30989	-25.1361	-0.17588
32	1.0819	-0.2501	0.055086	0.689809	7.670903	23.58042	0.690809	4.5737	-22.0132	-0.16831
33	1.1896	-0.2501	0.057181	0.706173	7.726584	22.73426	0.708485	4.62931	-26.7427	-0.21038
34	1.3082	-0.2501	0.065806	0.722935	7.232319	20.18159	0.725086	4.41426	-18.4267	-0.17445
35	1.4385	-0.2501	0.061681	0.736765	7.526687	18.436	0.738342	4.78554	-33.5583	-0.3341
36	1.5819	-0.2501	0.062627	0.757199	7.842371	15.29497	0.759801	4.74311	-23.7911	-0.27408
37	1.7395	-0.2501	0.060373	0.768634	7.791523	14.4752	0.769007	4.50276	-29.2793	-0.35873
38	1.9132	-0.2501	0.058183	0.777985	7.744855	12.51062	0.780157	4.27703	-26.472	-0.37753

A	A	B	C	D	E	F	G	H	I	J
1										
2	Pitchwise Survey at Station 15									
3										
4										
5	X(in)	Y(in)	U/Vref	V/Vref	U-Turb	V-Turb	Utot/Vref	UV-Angle	UV-Reyn.	UV-Correl.
6								Mean	Stress	Coeff.
7	0.1023	0.0001	-0.00017	0.190234	-4.31419	16.53814	0.190234	-0.05025	-14.3479	-0.27743
8	0.1122	0.0001	0.02125	0.179686	6.03404	17.92427	0.180847	6.74791	-20.7209	-0.2843
9	0.1232	0.0001	-0.00677	0.217179	-4.93036	17.08396	0.217285	-1.78547	-12.7922	-0.20952
10	0.135	0.0001	-0.00383	0.226001	-4.92975	17.57023	0.226034	-0.97134	-10.4269	-0.18807
11	0.1484	0.0001	-0.00129	0.215581	-5.42929	18.9469	0.215584	-0.34374	-15.0907	-0.20238
12	0.163	0.0001	-0.00202	0.226618	-5.47525	18.97167	0.226627	-0.51178	-11.9319	-0.15847
13	0.179	0.0001	0.002706	0.23105	5.804713	19.66858	0.231066	0.671399	-12.7104	-0.15358
14	0.1966	0.0001	0.003787	0.269034	5.846782	18.08212	0.269061	0.806383	-10.8953	-0.14217
15	0.216	0.0001	0.004747	0.280503	6.148959	19.1767	0.280543	0.969472	-12.2394	-0.14319
16	0.2372	0.0001	0.004019	0.283285	6.205426	19.99172	0.283315	0.812823	-11.5275	-0.12819
17	0.2609	0.0001	0.004147	0.313	6.253277	19.99838	0.313027	0.759133	-8.33302	-0.09193
18	0.2866	0.0001	0.00488	0.336224	6.425453	20.80532	0.33626	0.831535	-9.03704	-0.09326
19	0.3149	0.0001	0.008319	0.361119	6.549255	20.12782	0.361214	1.3196	-10.6833	-0.1118
20	0.3461	0.0001	0.01217	0.388762	6.568801	20.5903	0.388953	1.79308	-8.40287	-0.08584
21	0.3805	0.0001	0.011145	0.415672	6.607618	20.36397	0.415821	1.53589	-5.57472	-0.05716
22	0.4182	0.0001	0.010534	0.434986	6.802207	21.91892	0.435093	1.38734	-7.81898	-0.07235
23	0.4598	0.0001	0.015642	0.470222	6.641853	22.36175	0.470483	1.90519	-3.28957	-0.03056
24	0.5055	0.0001	0.017419	0.488156	6.731036	23.28209	0.488468	2.04366	1.49054	0.013121
25	0.5558	0.0001	0.01879	0.489484	6.77794	26.8939	0.489844	2.19837	-3.44808	-0.0261
26	0.611	0.0001	0.022315	0.596396	6.194497	23.4124	0.596813	2.14283	2.36322	0.02248
27	0.6719	0.0001	0.027125	0.66066	5.526346	21.78156	0.661436	2.35035	-4.036	-0.04626
28	0.7386	0	0.02759	0.637346	6.123647	23.78868	0.637943	2.47872	5.49933	0.052079
29	0.8124	0	0.028152	0.668235	5.618915	22.65666	0.668827	2.41237	8.1967	0.068824
30	0.8932	0	0.030381	0.704681	5.119244	20.32384	0.705235	2.46904	7.76756	0.102995
31	0.9822	0	0.041084	0.80933	2.488081	5.883482	0.810372	2.90598	-0.24551	-0.02314
32	1.0802	0	0.042426	0.809341	2.708922	5.758055	0.810452	3.00076	-0.93154	-0.08251
33	1.1878	0	0.041209	0.819739	2.350846	3.75124	0.820774	2.8779	0.021916	0.003428
34	1.3085	0	0.042075	0.818001	2.58207	3.77594	0.819082	2.94452	-0.45672	-0.06462
35	1.4368	0	0.044711	0.820134	2.429259	2.667009	0.82135	3.12047	-0.51047	-0.1087
36	1.5802	0	0.044674	0.817525	2.603283	2.645715	0.818744	3.12782	-0.68913	-0.13803
37	1.7379	0	0.044405	0.816752	2.794024	2.542247	0.817958	3.112	-0.65427	-0.12707
38	1.9114	0	0.045262	0.815839	2.471915	2.297037	0.817095	3.17546	-0.76776	-0.18654

Pitchwise Survey at Station 16

	X(in)	Y(in)	U/Vref	V/Vref	Utot/Vref
7	4	0.282	0.11809	0.836435	0.846315
8	3.8749	0.282	0.080433	0.804286	0.811014
9	3.75	0.282	0.082987	[illegible]	0.57154
10	3.6251	0.2821	0.053636	[illegible]	0.524813
11	3.4999	0.282	0.043819	[illegible]	0.487701
12	3.3749	0.282	0.037743	0.370887	0.372472
13	3.2499	0.2821	0.028388	0.271914	0.273383
14	3.125	0.282	0.00898	0.183339	0.183449
15	2.9999	0.282	0.079827	0.178858	0.193773
16	2.8749	0.282	0.048883	0.820445	0.821717
17	2.7499	0.282	0.033082	0.834207	0.834862
18	2.625	0.282	0.038889	0.828745	0.830865
19	2.4999	0.2819	0.038808	0.825521	0.828341
20	2.375	0.282	0.038808	0.827025	0.827888
21	2.2499	0.282	0.044241	0.822718	0.823806
22	2.125	0.2821	0.044777	0.82054	0.821782
23	2	0.2819	0.04375	0.818836	0.819703
24	1.875	0.282	0.044225	0.819326	0.820518
25	1.7499	0.282	0.047043	0.818863	0.820204
26	1.6251	0.282	0.044447	0.818621	0.819727
27	1.5	0.2819	0.048889	0.820083	0.821363
28	1.375	0.2819	0.044214	0.819616	0.820707
29	1.25	0.282	0.043986	0.819283	0.820444
30	1.125	0.282	0.038887	0.820786	0.821706
31	1	0.282	0.038522	0.811811	0.812723
32	0.875	0.282	0.057946	0.670033	0.672533
33	0.75	0.2819	0.048686	0.814101	0.816021
34	0.625	0.282	0.053887	0.552419	0.556042
35	0.4999	0.282	0.048743	0.475717	0.478208
36	0.375	0.282	0.042177	0.402986	0.405167
37	0.2499	0.2819	0.017319	0.318093	0.318567
38	0.125	0.282	-0.00536	0.192782	0.192857
39	-0.0001	0.282	0.046429	0.120029	0.128696
40	-0.125	0.282	0.041419	0.830205	0.831238
41	-0.25	0.282	0.029976	0.843608	0.84404
42	-0.375	0.282	0.03078	0.837068	0.837623
43	-0.5	0.282	0.031856	0.828376	0.82999
44	-0.625	0.282	0.035245	0.823648	0.824302
45	-0.75	0.282	0.037721	0.8222	0.823086
46	-0.875	0.282	0.038545	0.817231	0.81814
47	-1	0.282	0.041611	0.818346	0.819403
48	-1.125	0.2819	0.043671	0.818807	0.819771
49	-1.25	0.282	0.045179	0.821205	0.822446
50	-1.375	0.282	0.045423	0.822047	0.823301
51	-1.5	0.282	0.045001	0.829056	0.828281
52	-1.625	0.282	0.043242	0.827396	0.828525
53	-1.7501	0.2819	0.044032	0.826	0.827174
54	-1.875	0.2819	0.088889	0.738368	0.739401
55	-2.0001	0.2819	0.088098	0.647399	0.650764

Pitchwise Survey at Station 17

	X(in)	Y(in)	U/Vref	V/Vref	Utot/Vref
7	3.9999	0.3619	0.052586	0.708831	0.710578
8	3.8752	0.3619	0.063403	0.646912	0.648013
9	3.75	0.362	0.046292	0.616835	0.618889
10	3.625	0.362	0.049823	0.512464	0.51486
11	3.5	0.362	0.051683	0.438849	0.442878
12	3.3749	0.362	0.040836	0.36388	0.366175
13	3.2499	0.362	0.028272	0.286508	0.288883
14	3.125	0.362	0.018226	0.167084	0.168046
15	2.9999	0.362	0.073017	0.171089	0.188047
16	2.8749	0.362	0.054895	0.816098	0.817849
17	2.7501	0.362	0.040815	0.830858	0.831889
18	2.625	0.362	0.041368	0.828928	0.828861
19	2.5	0.362	0.043145	0.822937	0.824087
20	2.3749	0.362	0.041711	0.822328	0.823386
21	2.2499	0.362	0.040863	0.818854	0.819677
22	2.125	0.362	0.043011	0.819481	0.820889
23	2	0.362	0.043335	0.819156	0.820301
24	1.875	0.362	0.044236	0.816309	0.817506
25	1.75	0.362	0.043884	0.817323	0.818505
26	1.625	0.362	0.041322	0.817328	0.818372
27	1.5	0.362	0.041884	0.815886	0.817068
28	1.375	0.362	0.04079	0.818131	0.819147
29	1.25	0.362	0.038234	0.816193	0.817137
30	1.125	0.362	0.036386	0.82086	0.821386
31	0.9999	0.362	0.034437	0.810831	0.811383
32	0.875	0.362	0.038417	0.70574	0.706786
33	0.75	0.362	0.044884	0.627436	0.629025
34	0.625	0.362	0.041745	0.564887	0.566464
35	0.4999	0.362	0.034899	0.465788	0.467111
36	0.375	0.362	0.032902	0.381719	0.383101
37	0.25	0.362	0.018296	0.297897	0.298459
38	0.125	0.362	0.004934	0.172808	0.172978
39	-0.0001	0.362	0.06836	0.205051	0.216146
40	-0.125	0.362	0.048118	0.822234	0.823641
41	-0.2501	0.362	0.035098	0.838625	0.838358
42	-0.375	0.362	0.034811	0.831387	0.832116
43	-0.5	0.362	0.03505	0.828016	0.828759
44	-0.625	0.362	0.036491	0.824953	0.825759
45	-0.75	0.362	0.038839	0.820382	0.821272
46	-0.875	0.362	0.042171	0.819434	0.82062
47	-1	0.3619	0.042753	0.818902	0.820018
48	-1.125	0.3619	0.043852	0.822261	0.823419
49	-1.25	0.362	0.043346	0.821515	0.822858
50	-1.375	0.362	0.043524	0.822705	0.823856
51	-1.5	0.362	0.041885	0.82504	0.826091
52	-1.625	0.362	0.043058	0.825808	0.82673
53	-1.75	0.362	0.043221	0.823598	0.824731
54	-1.875	0.362	0.053286	0.739543	0.741459
55	-2.0001	0.362	0.058677	0.704256	0.706712

A	A	B	C	D	E
1					
2	Pitchwise Survey at Station 18				
3					
4					
5	X(in)	Y(in)	U/Vref	V/Vref	Utot/Vref
6					
7	4	0.678	0.046168	0.711867	0.713388
8	3.875	0.6779	0.064289	0.664807	0.667086
9	3.7499	0.678	0.044898	0.819434	0.821086
10	3.6251	0.678	0.054889	0.512839	0.516725
11	3.5	0.678	0.046273	0.428137	0.428536
12	3.3749	0.678	[illegible]	0.342742	0.344878
13	3.25	0.678	[illegible]	[illegible]	[illegible]
14	3.125	0.678	[illegible]	[illegible]	0.212329
15	2.9999	0.678	0.110023	[illegible]	0.409403
16	2.8749	0.6779	0.057889	0.81821	0.813047
17	2.7499	0.6779	[illegible]	0.825182	0.827026
18	2.625	0.6779	0.048883	0.821782	0.823226
19	2.5	0.6779	0.051308	0.818828	0.820534
20	2.3749	0.6779	0.044784	0.819884	0.821105
21	2.2499	0.6779	0.049826	0.822161	0.823317
22	2.1251	0.6779	0.044829	0.821321	0.822532
23	1.9999	0.6779	0.042754	0.818827	0.820043
24	1.875	0.6779	0.042386	0.818583	0.820476
25	1.75	0.6779	0.038439	0.817282	0.818186
26	1.625	0.6779	0.039418	0.818883	0.818616
27	1.5	0.6779	0.038287	0.817082	0.817878
28	1.375	0.6779	0.038289	0.816881	0.817782
29	1.25	0.6779	0.034165	0.812884	0.813882
30	1.125	0.6779	0.032789	0.808802	0.810887
31	1	0.6779	0.034182	0.733832	0.734428
32	0.875	0.6779	0.03246	0.689334	0.684084
33	0.75	0.6779	0.033104	0.637409	0.638288
34	0.625	0.6779	0.038016	0.534826	0.538038
35	0.5	0.6779	0.031536	0.482273	0.483346
36	0.3749	0.6779	0.031001	0.381838	0.382284
37	0.25	0.6779	0.036486	0.288885	0.291138
38	0.125	0.6779	0.041881	0.213848	0.217873
39	-0.0001	0.6779	0.112788	0.420914	0.436489
40	-0.125	0.6779	0.07172	0.811421	0.814883
41	-0.2501	0.6779	0.088612	0.82884	0.830806
42	-0.375	0.6779	0.108067	0.824846	0.831311
43	-0.5	0.6779	0.088918	0.822127	0.824786
44	-0.625	0.6779	0.071439	0.818874	0.821786
45	-0.75	0.6779	0.084642	0.813873	0.818084
46	-0.875	0.6779	0.039884	0.810823	0.811488
47	-1	0.6779	0.038122	0.810406	0.811348
48	-1.125	0.6779	0.040844	0.810737	0.811788
49	-1.25	0.6779	0.038184	0.810381	0.811281
50	-1.375	0.6779	0.037307	0.811738	0.812894
51	-1.5	0.6779	0.088113	0.773889	0.778866
52	-1.625	0.6779	0.088888	0.730873	0.733338
53	-1.75	0.6779	0.048103	0.722881	0.72428
54	-1.875	0.6779	0.042675	0.708888	0.701806
55	-2.0001	0.6779	0.044676	0.684187	0.688886
56					
57					

A	A	B	C	D	E
1					
2	Pitchwise Survey at Station 19				
3					
4					
5	X(in)	Y(in)	V/Vref	U/Vref	Utot/Vref
6					
7	4	1.062	0.648836	0.045428	0.650423
8	3.8749	1.062	0.593664	0.047283	0.595545
9	3.7499	1.062	0.539536	0.064241	0.543348
10	3.625	1.062	0.458732	0.066275	0.463495
11	3.4999	1.0621	0.381301	0.067584	0.387244
12	3.375	1.0621	0.313349	0.088954	0.325731
13	3.2499	1.062	0.270483	0.092135	0.285745
14	3.125	1.062	0.29637	0.114881	0.317861
15	2.9999	1.062	0.500317	0.128402	0.51653
16	2.8749	1.062	0.751736	0.085763	0.756612
17	2.75	1.062	0.801687	0.080214	0.803954
18	2.625	1.062	0.80453	0.053855	0.806339
19	2.4999	1.0621	0.803993	0.052009	0.805673
20	2.375	1.062	0.807821	0.046796	0.809175
21	2.2499	1.062	0.804133	0.042181	0.805236
22	2.125	1.062	0.799716	0.046391	0.801061
23	2	1.062	0.796247	0.044487	0.79749
24	1.8749	1.062	0.787706	0.041043	0.788775
25	1.75	1.062	0.784094	0.040042	0.785116
26	1.625	1.062	0.773381	0.057808	0.775538
27	1.5	1.062	0.771805	0.044626	0.773095
28	1.375	1.062	0.757053	0.041686	0.758198
29	1.25	1.062	0.730557	0.042301	0.731781
30	1.125	1.062	0.697233	0.050224	0.699039
31	1	1.062	0.680525	0.044032	0.681947
32	0.8749	1.062	0.624977	0.044907	0.626569
33	0.75	1.062	0.567363	0.046554	0.569457
34	0.625	1.062	0.488677	0.054116	0.491662
35	0.4999	1.062	0.42062	0.058125	0.424348
36	0.375	1.062	0.337681	0.070404	0.344943
37	0.25	1.062	0.27922	0.077963	0.2899
38	0.125	1.062	0.308189	0.114845	0.328892
39	-0.0001	1.0621	0.509506	0.136418	0.527453
40	-0.125	1.062	0.752714	0.085789	0.757587
41	-0.2501	1.062	0.812449	0.156084	0.827306
42	-0.375	1.062	0.812519	0.057189	0.814529
43	-0.5	1.062	0.809641	0.049519	0.811153
44	-0.625	1.0621	0.808071	0.053018	0.809807
45	-0.75	1.062	0.805714	0.0441	0.80692
46	-0.875	1.062	0.799134	0.043409	0.800312
47	-1	1.062	0.793731	0.045474	0.795034
48	-1.125	1.062	0.784869	0.061286	0.787259
49	-1.25	1.0621	0.771919	0.051337	0.773624
50	-1.375	1.062	0.751107	0.101639	0.757953
51	-1.5	1.062	0.700034	0.09275	0.706151
52	-1.625	1.062	0.702867	0.056862	0.705167
53	-1.75	1.062	0.678617	0.053694	0.680737
54	-1.875	1.062	0.667042	0.058351	0.669589
55	-2	1.0621	0.615872	0.069776	0.619811

REFERENCES

1. Hobson, G. V., and Shreeve, R. P., "Inlet Turbulence Distortion and Viscous Flow Development in a Controlled-Diffusion Compressor Cascade at Very High Incidence", AIAA paper 91-2004 presented at the 27th Joint Propulsion Conference, Sacramento, California June 24-26 1991.

2. Classick, M. A., "Off-Design Loss Measurements in a Compressor Cascade", Master's Thesis, Naval Postgraduate School, Monterey, California, September 1989.

3. Murray, K. D., "Automation and Extension of LDV Measurements of Off-Design Flow in a Subsonic Cascade Wind Tunnel", Engineer's Thesis, Naval Postgraduate School, Monterey, California, June 1989.

4. Wakefield, B. E., "Hotwire Measurements of the Turbulent Flow into a Cascade of Controlled-Diffusion Compressor Blades", Master's Thesis, Naval Postgraduate School, Monterey, California, December 1993.

5. Elazar, Y., "A Mapping of the Viscous Flow Behavior in a Controlled Diffusion Compressor Cascade Using Laser Doppler Velocimetry and Preliminary Evaluation of Codes for the Prediction of Stall", Doctoral Thesis, Naval Postgraduate School, Monterey, California, March 1988.

6. Dreon, J. W., "Controlled Diffusion Compressor Blade Wake Measurements", Master's Thesis, Naval Postgraduate School, Monterey, California, September 1986.

7. Armstrong, J. H., "Near-Stall Loss Measurements in a CD Compressor Cascade With Exploratory Leading Edge Flow Control", Master's Thesis, Naval Postgraduate School, Monterey, California, June 1990.

INITIAL DISTRIBUTION LIST

1.	Defense Technical Information Center Cameron Station Alexandria, Virginia 22304-6145	2
2.	Library, Code 52 Naval Postgraduate School Monterey, California 93943-5000	2
3.	Department Chairman, AA Department of Aeronautics Naval Postgraduate School Monterey, California 93943	1
4.	Garth V. Hobson, Turbopropulsion Laboratory, Code AA/Hg Department of Aeronautics Naval Postgraduate School Monterey, California 93943	7
5.	Naval Air Systems Command AIR-536T (Attn: Mr. Mario Duffles) Washington, District of Columbia 20361-5360	1
6.	Naval Air Warfare Center Aircraft Division (Trenton) PE-31 (Attn: S. Clouser) 250 Phillips Blvd. Princeton Crossroads Trenton, New Jersey 08628-0176	1
7.	N.L. Sanger NASA Lewis Research Center M/S 5-11, 21000 Brookpark Road Cleveland, Ohio 44135	1

8. Lt. Humberto Javier Ganaim Rickel 2
Venezuelan Navy
Acquisition Office
880 NW 15th St.
Miami, Florida 33172